DOCUMENT RESUME

ED 148 197 HE 009 377

AUTHOR Gilford, Dorothy M.; Snyder, Joan
TITLE Women and Minority Ph.D.'s in the 1970's: A Data Book.
INSTITUTION National Academy of Sciences - National Research Council, Washington, D.C. Commission on Human Resources.
PUB DATE 77
NOTE 247p.; Not available in hard copy due to marginal legibility of original document
AVAILABLE FROM National Academy of Sciences - National Research Council, Commission on Human Resources, Washington, D.C.

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Comparative Statistics; *Doctoral Degrees; Employment; Ethnic Groups; *Females; Graduate Students; Higher Education; Jobs; *Minority Groups; Questionnaires; *Sampling; Statistical Data; *Statistical Surveys; Tables (Data); Universities

ABSTRACT

Selected data from the Commission on Human Resources data base are reported for two major groups that have been underrepresented in doctoral education in the past: minorities and women. A wide selection of tabulations of data on doctorate holders by sex and racial/ethnic group membership is presented. Characteristics of minority and women Ph.D. recipients are reported, including: citizenship by year of degree, labor force composition in 1975, region of birth, education of father and mother, age at Ph.D., marital status, number of dependents, broad field of doctorate, baccalaureate field, elapsed time, sources of support in graduate school, and postdoctoral employment and study plans. Data on women and minority Ph.D.'s in the U.S. labor force cover field of employment, employment sector, primary work activity, salary, and employment status. Further tabulations are provided on baccalaureate and doctoral institutions of women and minority Ph.D.'s. Recommendations for further study are appended. (LBH)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED148197

Women and Minority Ph.D.'s in the 1970's:
A Data Book

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

BEST COPY AVAILABLE

Commission on Human Resources

HE009377

HIGHLIGHTS 1/

- In 1976, women in minority groups constituted 9.2% of all women doctorate recipients whereas men in those groups constituted only 5.6% of all men doctorate recipients. (Table I-4)

- The Chicano group is the racial/ethnic group having the largest proportion of Ph.D.'s whose parents have low levels of educational attainment. (Tables I-6 and I-7)

- Among recent Ph.D.'s 14.4% of the men were over 40 years of age when they received the doctorate compared with 25.8% of the women. (Table I-8)

- In 1975, the category of Ph.D.'s desiring, but not holding, full-time employment in science or engineering included 6.4% of the women Ph.D.'s and 1.6% of the men Ph.D.'s. (Table II-9)

- There is a strong tendency for minority-group Ph.D.'s to have graduated from undergraduate institutions in states where these minority groups have been concentrated. (Table III-2)

- For Blacks, more than half of the undergraduate institutions that ranked in the top 25 in number of graduates who obtained doctorates in 1973-1976, in each major field, are in the "Old South" and are institutions that historically have been predominantly Black institutions. (Table III-4)

- In 1973-1976, over two-thirds of the Asian Ph.D.'s of each sex received their doctorates at the most research-oriented institutions although less than 55% of the doctorates were awarded by these institutions. (Table III-5)

- Two-thirds of the private research universities, but just over one-third of the public research universities, were above the national average in the proportion of doctorates awarded to women in 1973-1976. (Table III-8, Analysis I)

1/ Highlights listed in order of appearance in the report.

WOMEN AND MINORITY PH.D.'S IN THE 1970'S:

A DATA BOOK

Dorothy M. Gilford

and

Joan Snyder

Commission on Human Resources
NATIONAL RESEARCH COUNCIL

NATIONAL ACADEMY OF SCIENCES
1977

BOARD ON HUMAN-RESOURCE
DATA AND ANALYSES

MICHAEL J. PELCZAR, JR., CHAIRMAN
Vice President for Graduate Studies and Research,
University of Maryland

HELEN S. ASTIN
Professor of Education, Graduate School of Education
University of California at Los Angeles

ROBERT H. BURRIS
Professor of Biochemistry, University of Wisconsin

GERTRUDE M. COX
Director, Statistics Research Division, Research Triangle Institute
(Retired)

WADE ELLIS
Associate Dean, Graduate School, University of Michigan

RICHARD BARRY FREEMAN
Associate Professor of Economics, Harvard University

LEE GRODZINS
Professor of Physics, Massachusetts Institute of Technology

ROBERT E. HENZE
Director of Membership Division, American Chemical Society

LLOYD G. HUMPHREYS
Professor of Psychology, University of Illinois

WINTON H. MANNING
Vice President, Educational Testing Service

MAYNARD L. PENNELL
Vice President-Product Development, The Boeing Company
(Retired)

ROBERT R. RAYMO
Dean, Graduate School of Arts and Science, New York University

LEWIS SLACK
Associate Director, American Institute of Physics

ACKNOWLEDGMENTS

This study, which was conducted under the aegis of the former Board on Human-Resource Data and Analyses, was made possible by the financial support of the National Research Council. The foresight of the National Research Council and of the National Science Foundation, National Institutes of Health, U.S. Office of Education and the National Endowment for the Humanities in their long-range commitment to one or both of the two major surveys - the Survey of Earned Doctorates and the Survey of Doctoral Scientists and Engineers - made this study possible. These surveys, the major data sources for this study, were among the earliest large-scale surveys to collect racial/ethnic data.

We are indebted to many people who helped produce this report and we want to express our deep appreciation to them.

Mr. Peter Syverson made major contributions to the report. He was responsible for checking the accuracy of the statistics and the validity of statistical statements based on sample data and for supervising the revisions of the report. He also programmed the tabulations based on the Survey of Earned Doctorates.

Mrs. Nancy Ahern did the programming of tabulations based on the Survey of Doctoral Scientists and Engineers and was helpful in answering many detailed questions about the quality of the data and the coding structure used.

Mrs. Muriel Quinones and Miss Lelia Glenn, assisted by Mrs. Helen MacNeil and Mrs. Sue Henry, willingly carried out the demanding and extensive clerical work, typing and proofreading of the several drafts of the report.

The members of the former Board on Human-Resource Data and Analyses reviewed the report and provided many constructive suggestions. Dr. Helen Astin, who served as lead reviewer for the Board, reviewed the planned list of tables and made many suggestions in addition to providing a valuable detailed review of the report. Dr. Lilli Hornig, Chairman of the Committee on Education and Employment of Women in Science and Engineering, and Dr. Vera Kistiakowsky and Dr. Neena B. Schwartz of that

Committee all provided helpful reviews as did Dr. Marcus Alexis and Dr. Arthur Diaz of the Committee on Education and Employment of Minority Group Members in Science.

Special appreciation is due to Dr. Robert A. Alberty, Chairman of the Commission on Human Resources and Dr. William C. Kelly, Executive Director of the Commission, who provided detailed reviews of the report and administrative support for the project.

Dorothy M. Gilford, Director
Human Resources Studies
Commission on Human Resources

Joan Snyder, Ph.D.
Consultant

CONTENTS

Page

INTRODUCTION 1
Objectives 1
Minority Groups 2
Data Sources 8
Limitations of the Data 9
Organization of the Report 13

CHAPTER I: CHARACTERISTICS OF MINORITY AND WOMEN PH.D. RECIPIENTS 14

Table I-1 CITIZENSHIP BY YEAR OF DEGREE by Sex for 1958-1976 16

I-2 LABOR FORCE COMPOSITION IN 1975 by Racial/Ethnic Group by Citizenship for 1930-1974 Ph.D. Cohorts 18

I-3 LABOR FORCE COMPOSITION IN 1975 by Sex by Citizenship for 1930-1974 Ph.D. Cohorts 24

I-4 DOCTORATE RECIPIENTS by Sex and Racial/Ethnic Group for 1973-1976 26

I-5 REGION OF BIRTH by Sex and Racial/Ethnic Group for 1973-1976 28

I-6 EDUCATION OF FATHER by Sex and Racial/Ethnic Group of Doctorate Recipient for 1973-1976 30

I-7 EDUCATION OF MOTHER by Sex and Racial/Ethnic Group of Doctorate Recipient for 1973-1976 32

I-8 AGE AT PH.D. by Sex and Racial/Ethnic Group for 1973-1976 34

I-9 MARITAL STATUS AT TIME OF PH.D. by Sex and Racial/Ethnic Group for 1973-1976 36

Page

Table I-10 NUMBER OF DEPENDENTS 38
by Sex and Racial/Ethnic Group
for 1975-1976

I-11 BROAD FIELD OF DOCTORATE 40
by Sex and Racial/Ethnic Group
for 1973-1976

I-12 BACCALAUREATE FIELD 42
by Sex and Racial/Ethnic Group
by Ph.D. Field
for 1973-1976

I-13 EDUCATION OF FATHER 48
by Sex and Racial/Ethnic Group of Doctorate Recipient
by Ph.D. Field
for 1973-1976

I-14 ELAPSED TIME FROM B.A. TO ENTRANCE TO GRADUATE SCHOOL 52
by Sex and Racial/Ethnic Group
for 1973 and 1976

I-15 YEARS OUT OF SCHOOL BETWEEN ENTRANCE TO GRADUATE SCHOOL AND PH.D. 54
by Sex and Racial/Ethnic Group
for 1973 and 1976

I-16 SOURCES OF SUPPORT IN GRADUATE SCHOOL 56
by Sex and Racial/Ethnic Group
for 1973-1976

I-17 POSTDOCTORAL EMPLOYMENT AND STUDY PLANS 60
by Sex and Racial/Ethnic Group
for 1973-1976

CHAPTER II: WOMEN AND MINORITY PH.D.'S IN THE U.S. LABOR FORCE 63

Table II-1 FIELD OF EMPLOYMENT 64
by Racial/Ethnic Group
by Citizenship
for 1975

II-2 FIELD OF EMPLOYMENT 68
by Sex
by Citizenship
for 1973 and 1975

II-3 EMPLOYMENT SECTOR 72
by Racial/Ethnic Group
by Citizenship
for 1975

Page

Table II-4 EMPLOYMENT SECTOR AND PRIMARY WORK ACTIVITY 74
by Sex
for 1973 and 1975

II-5 EMPLOYMENT SECTOR AND PRIMARY WORK ACTIVITY 76
for Whites, Asians and Other Minorities
for 1975

II-6 MEDIAN ANNUAL SALARY 78
by Sex and Racial/Ethnic Group
for 1973 and 1975

II-7 MEDIAN ANNUAL SALARY FOR PH.D.'S EMPLOYED IN INSTITUTIONS OF HIGHER EDUCATION 80
by Sex and Racial/Ethnic Group
for 1975

II-8 EMPLOYMENT STATUS 82
for Whites, Asians and Other Minorities
for 1973 and 1975

II-9 DOCTORATE RECIPIENTS DESIRING, BUT NOT HOLDING, FULL-TIME EMPLOYMENT 84
by Sex and Racial/Ethnic Group
for 1973 and 1975

CHAPTER III: BACCALAUREATE AND DOCTORAL INSTITUTIONS OF WOMEN AND MINORITY PH.D.'s 86

Table III-1 UNDERGRADUATE INSTITUTIONS ORDERED BY NUMBER OF GRADUATES WHO OBTAINED DOCTORATES 89
by Sex
for 1973-1976

III-2 UNDERGRADUATE INSTITUTIONS ORDERED BY NUMBER OF GRADUATES WHO OBTAINED DOCTORATES 92
by Racial/Ethnic Group
for 1973-1976

III-3 UNDERGRADUATE INSTITUTIONS ORDERED BY NUMBER OF GRADUATES WHO OBTAINED DOCTORATES 97
by Sex
by Field
for 1973-1976

III-4 UNDERGRADUATE INSTITUTIONS ORDERED BY NUMBER OF GRADUATES WHO OBTAINED DOCTORATES 106
by Racial/Ethnic Group
by Field
for 1973-1976

III-5 CARNEGIE CLASSIFICATION OF DOCTORATE-GRANTING INSTITUTIONS 122
by Sex and Racial/Ethnic Group
for 1973-1976

Page

Table III-6 DOCTORATE RECIPIENTS BY YEAR INSTITUTION FIRST GRANTED PH.D.
for Women and Racial/Ethnic Groups
for 1973-1976 124

III-7 PERCENT OF FEMALE FACULTY AND PERCENT OF FEMALE PH.D.'S
for 140 Doctorate-Granting Institutions
for 1976 126

III-8 INSTITUTIONS THAT WERE ABOVE AVERAGE IN DOCTORATES GRANTED TO WOMEN
for 1973-1976 131

III-9 INSTITUTIONS ORDERED BY PERCENT OF DOCTORATES GRANTED TO WOMEN
by Field
for 1973-1976 136

RECOMMENDATIONS FOR FURTHER STUDY 143

REFERENCES 146

APPENDIX A FINE FIELD OF PH.D. FOR ALL DOCTORATE RECIPIENTS
by Racial/Ethnic Group
by Citizenship
for 1973-1976 149

B FINE FIELD OF PH.D. FOR WOMEN DOCTORATE RECIPIENTS
by Racial/Ethnic Group
by Citizenship
for 1973-1976 161

C QUESTIONNAIRES AND SPECIALTY LISTS 173
a. 1975 Comprehensive Roster Survey of Doctoral Scientists and Engineers 174
b. 1976 Survey of Earned Doctorates 178

D SAMPLE DESIGN, SAMPLING ERRORS AND TESTS OF SIGNIFICANCE 181

INTRODUCTION

Objectives

The Commission on Human Resources (CHR) of the National Research Council has extensive data on individual doctorate recipients in the United States derived from surveys of this group. The data base is widely used by individual researchers, professional societies, universities and agencies of the Federal and state governments. The purpose of this report is to make selected data from the CHR data base available to a larger group of potential users by providing data concerning two major groups that have been underrepresented in doctoral education in the past, minorities and women. A wide selection of tabulations of data on doctorate holders by sex and racial/ethnic group membership is presented.

Users of these data have a growing interest in the degree to which change is occurring in the education and employment patterns of minority and women Ph.D.'s. These groups have been the subject of legislation and affirmative-action programs for approximately a decade. Their numbers have now grown sufficiently to permit description of the status and characteristics of these groups and, to some degree, to document the extent to which they have achieved more adequate representation in education and employment. CHR data permit such description of changes in the labor force in recent years and of the characteristics of those who have earned doctorates over the last four years.

The tables presented here control simultaneously on sex and racial/ethnic group membership when sample sizes are adequate, i.e., data are shown separately for each minority group within each sex. This is done to provide more precise identification of attainment patterns of doctorates of distinct population groups. Certain educational patterns have been typical of specific minority groups. Other such patterns appear to be more closely related to sex than to racial/ethnic group membership.

The educational outcome for any individual reflects the combination of both types of factors. For example, in comparison with other groups, Asians have produced a large proportion of engineers but over the last four years, have apparently not produced a single woman doctoral engineer. It is, therefore, more accurate to describe educational patterns separately for each sex within each racial/ethnic group, rather than to attempt to generalize about the racial/ethnic group as a whole.

This is clearly seen in the examination of rates of change in the production of Ph.D.'s (see Table I-4). Minority women appear to be responding to recent forces for change in both the status of minorities and the status of women. Thus, while total minority representation is increasing among doctorate recipients, the number of women is increasing at a faster rate than the number of men in every minority group. Such patterns only become apparent when sex and group membership are analyzed simultaneously.

Of the many tables that could have been presented, a few have been selected for inclusion in this report based on their utility for: planning for the education and employment of women and minority group members; providing understanding of the roles played by various types of institutions in the education and employment of minority members and women; and research on the background characteristics, education and employment associated with achievement by women and members of minority groups.

Each table provides data to be employed by users according to their various concerns. The brief discussion of each table touches only some of the highlights of the data, leaving to the users the extensive and varied analyses that are possible.

Minority Groups

In the presentation of data, emphasis is placed on the population born in the United States, although it is recognized that the foreign-born contribute substantially to the U.S. labor force. Laws and affirmative action programs have been directed toward providing equal educational opportunities in this country. Although they apply to all citizens they primarily affect the native-born and it is this group for which change needs to be measured. Furthermore, it is quite probable that background factors and earlier educational experience related to achievement are not equivalent for native and foreign-born individuals. Thus foreign-born women may represent a highly select group in terms of social class or other characteristics so that their experiences are not comparable to those of women born in this country. (Table I-1 shows the naturalized population to have had a consistently higher proportion of women Ph.D.'s than the native-born population.)

Similarly, by virtue of racial characteristics or national origins, foreign-born individuals may be categorized with or treated like members of native-born minorities when they are in this country but is is unlikely that their earlier experience has been comparable. For the most part, these individuals have not grown up as members of minorities in their home countries and, therefore, have not experienced discrimination. On the other hand, discrimination has affected every level of the educational process of minorities in this country. It is this condition that national policy now seeks to correct.

The racial/ethnic categories used in this study are based on those which have been established by the Office of Management and Budget for use in all federally sponsored surveys. The following is a brief set of descriptions of the groups distinguished in this study to provide some perspective on the origins of doctorate recipients.

a. Blacks

Blacks are the largest racial/ethnic minority in the United States with a population estimated at approximately 24.5 million, or 11.5% of the population (U.S. Bureau of the Census, 1976b, p. 25). Examination of the educational attainment level of the Black population of adults aged 25 or over shows that the Black population is disadvantaged relative to the White population. The gap has been narrowing, however, among younger individuals. The median number of years of school completed by White males aged 25 to 29 is 13.0 and for White females in this age group, 12.7. For both Black males and females of the same age group, the median is now 12.5 (U.S. Bureau of the Census, 1976a, pp. 10-12). The latter figure for Blacks also reveals a shift in that population. Among all Black adults, the level of educational attainment has been higher for women in the past but is now rising at a higher rate for men.

b. American Indians (Native Americans)

This group numbered about 800,000 or 0.4% of the population in 1970, and is composed of diverse groups in various states. It is the one minority group with a predominantly rural population. The five states with the largest Indian populations are Oklahoma, Arizona, California, New Mexico and North Carolina (U.S. Bureau of the Census, 1973c).

In the Survey of Earned Doctorates (described in detail in the section on Data Sources) the American Indian group appears to be somewhat overrepresented in relation to its proportion of the population, but it is not certain that the questionnaire selected those whose primary social identification is Indian. The form requested respondents to "Check all that apply" and the overwhelming majority of those who checked "American Indian" also checked "White/Caucasian". Census data show that the high school completion rate among Indians is extremely low for reservation groups. For example, on reservations in Arizona, for those aged 25 and over, it ranges from 9.9% to a high of 27.5% among the Hopis. On the other hand, in Standard Metropolitan Statistical Areas, the percent of adults who have completed high school varies from 17.9% in the area of Tucson, Arizona to a high of 65.8% in the Washington, D. C. area (U.S. Bureau of the Census, 1973c, pp. 138-143). The high school completion rate for the parents of American Indian doctorates is 62.0% for men and 68.2% for women.

c. Chicanos

The largest of the groups of Spanish origin, Chicanos number approximately 6.6 million, or 3.1% of the population (U.S. Bureau of the Census, 1977, p. 1). They are located primarily in the southwestern states of Texas, Colorado, Arizona, New

Mexico and California. The Chicano group is the group of Spanish origin with the largest percentage of adults, 24.2%, who have completed less than five years of school (U.S. Bureau of the Census, 1977, pp. 5-6). It is also a group currently showing rapid change in this report (see Table I-4).

The Census Bureau policy has been to designate individuals with Spanish surnames in the southwestern states listed above as Mexican in origin (U.S. Bureau of the Census, 1973a). Although the Earned Doctorate Survey Form uses the mixed category, "Spanish-American/Mexican-American/Chicano" we are using the abbreviated term, "Chicano" to reflect the fact that most of the doctorate recipients of 1973 to 1976, 78.3%, come from those southwestern states. In this report when this group has been combined with others of Spanish origin because of the small numbers represented in the Survey of Doctoral Scientists and Engineers, we have used the term, "Hispanic", to indicate all those of Spanish origin.

d. Puerto Ricans

The second largest Hispanic group consists of the mainland Puerto Ricans, now approximately 1,800,000 or 0.9% of the population (U.S. Bureau of the Census, 1977, p. 1). They are overwhelmingly urban and are located primarily in the cities of the eastern part of the United States, particularly in New York where they make up approximately ten percent of the population (U.S. Commission on Civil Rights, 1976, p. 5). Of the Hispanic groups, the Puerto Ricans have the lowest percent of adults, 25 and over, who have completed high school, 29.8%, (U.S. Bureau of the Census, 1977, pp. 5-6) and in 1969 had the smallest proportion of individuals able to read and write English (U.S. Commission on Civil Rights, 1976, p. 34).

In fact, the mainland Puerto Ricans have only minimal representation among those identifying themselves as Puerto Rican in the Survey of Earned Doctorates. The mainland group is approximately 35% of all Puerto Ricans (U.S. Commission on Civil Rights, 1976, p. 34) but only 21.6% of the Puerto Rican Ph.D.'s from 1973 to 1976 are from the mainland. The remainder were born in Puerto Rico and most studied there through the baccalaureate. The majority of the Puerto Rican Ph.D.'s in this study have not experienced life as members of a lower status minority.

Nevertheless, it is anticipated that the number of mainland Puerto Rican doctorate recipients will increase. It has been pointed out that mainland-born Puerto Ricans show substantially higher school enrollment figures than those born in Puerto Rico (U.S. Commission on Civil Rights, 1976, p. 98) but that the majority of those born on the mainland are still of preschool or elementary school age (U.S. Commission on Civil Rights, 1976, pp. 36-38). One indication of such prospects for change was the increase of Puerto Ricans as a percent of total enrollment in the City University of New York from 4.0% in 1969 to 7.4% in 1974 (U.S. Commission on Civil Rights, 1976, p. 119).

e. Asians

The diverse Asian groups included approximately 1.8 million individuals or 0.9% of the population in 1970 (U.S. Bureau of the Census, 1973d). The largest groups are of Japanese, Chinese and Filipino origin but the Asian category also includes substantial numbers of Hawaiians and Koreans and smaller numbers of Indonesians, Polynesians and others. Their largest concentrations are in the states of California and Hawaii. Educational attainment varies within the group with the Koreans and Japanese showing levels higher than those of Whites and in descending order, the Hawaiians, Chinese and Filipinos reflecting substantially lower levels. In the last group, there is a striking disparity between the sexes with Filipino women having a much higher level of attainment than men (U.S. Bureau of the Census, 1973d, p. 135).

To provide some perspective on the educational attainment of the various groups described above, the following table has been constructed. This table compares the educational level of the parents of individuals who received doctorates during the four-year period 1973-1976 with that of the most comparable group in the general population, those adults aged 45 to 64 at the time of the 1970 census. For example, the first line of the table shows that 48.7% of White men aged 45-64 in 1970 had completed high school, but 71.3% of the fathers of male Ph.D.'s and 76.7% of the fathers of female Ph.D.'s had done so. Similarly, 51.8% of White women in that age group of the general population had secondary diplomas but 79.1% of the mothers of male doctorate recipients and 81.6% of the mothers of female doctorate recipients had finished high school.

Percentages of the General Population and of Parents
of Ph.D.'s Who Have Completed High School 1/
by Sex and Racial/Ethnic Group

		(Ages 45-64) General Population 1970			Parents of Male Ph.D.'s 1973-1976	Parents of Female Ph.D.'s 1973-1976
Whites	Male	48.7%	2/	Fathers:	71.3%	76.7%
	Female	51.8		Mothers:	79.1	81.6
Blacks	Male	20.1	3/		42.9	55.1
	Female	22.7			53.5	65.7
American Indians	Male	27.4	4/		62.4	60.4
	Female	28.4			66.6	74.5
Chicanos	Male	15.8	5/		36.7	51.0
	Female	13.1			39.6	43.4
Puerto Ricans (Mainland)	Male	17.5	6/		54.9	70.2
	Female	14.2			49.3	63.1
Asians	Male	48.9	7/		68.6	73.1
	Female	51.1			68.5	67.7

1/ Although more recent data are available for some groups, they are not for others. Therefore, 1970 data were used for all groups to maintain comparability.

2/ Derived from U.S. Bureau of the Census, 1973e, pp. 37-39.

3/ Derived from U.S. Bureau of the Census, 1973e, pp. 42-45.

4/ U.S. Bureau of the Census, 1973c, p. 36.

5/ U.S. Bureau of the Census, 1973a, p. 55.

6/ U.S. Bureau of the Census, 1973b, p. 39.

7/ Derived from U.S. Bureau of the Census, 1973d, pp. 17, 76 and 135. The figures include Japanese, Chinese and Filipinos, the only groups for which data by sex and age are available, but the groups which together make up approximately 69% of the Asian population (U.S. Bureau of the Census, 1973d, p. x).

The table makes clear that Ph.D.'s come from groups more highly educated than the general population regardless of their racial/ethnic affiliation. It also indicates that within each group, women Ph.D.'s come from more highly educated families than male degree recipients.

Data Sources

The statistical tabulations in this report are derived from two of the large data files in the CHR data base - the Doctorate Records File and the Comprehensive Roster Surveys:

1. Survey of Earned Doctorates (Doctorate Records File)

The Doctorate Records File contains responses to questionnaires completed by essentially all individuals who have earned doctorates in all fields in the United States from 1958 to the present, i.e., information on the total population receiving Ph.D.'s during that period and limited information from other sources for the 1920-1957 Ph.D. cohorts. The reader should bear in mind, therefore, that although the numbers presented for certain groups are quite small, they describe the entire population.

The Survey of Earned Doctorates provides information on the educational history, background data and plans of degree recipients at the time the degree was awarded (see Appendix C for the survey form). Research doctorates in all fields are included. Applied research doctorates such as the Doctor of Education, Doctor of Arts, Doctor of Musical Arts and Doctor of Engineering are included but professional degrees such as the Doctor of Medicine, Doctor of Dental Science and Doctor of Veterinary Medicine are excluded.

Since 1973, the survey has included a question on racial/ethnic group membership. The responses to that question from 1973 to 1976 provide the basis for the present tabulations by racial/ethnic status.

2. Survey of Doctoral Scientists and Engineers (Comprehensive Roster Surveys)

A Comprehensive Roster of Doctoral Scientists and Engineers compiled from the

Doctorate Records File and other sources provided the basis for sample surveys, in 1973 and 1975, of individuals in the United States in those fields who received doctorates from foreign or U.S. universities in the periods from 1930 to 1972 and 1930 to 1974, respectively. Comparison of the data of the two surveys permits some assessment of change in the representation of women and minority members in the scientific labor force and in their employment patterns (see Appendix C for a copy of the survey form).

The Survey of Doctoral Scientists and Engineers also requests information on racial/ethnic status. Because these data are based on a sample, and because the number of science and engineering Ph.D.'s who are minority members was in fact quite small before the present decade, the survey has yielded relatively few responses from minority individuals. Therefore, to avoid large sampling errors (see Appendix D), the presentation of these data has generally required the combination of responses from different minority groups or the combination of data from different citizenship groups, or both.

Limitations of the Data

A. SURVEY OF EARNED DOCTORATES

Item non-response on the minority question: In conducting the Survey of Earned Doctorates, the questionnaire is administered by the graduate schools where degrees are granted, and old survey forms are sometimes used. This artifact can cause a high item non-response rate in the first year that a new question is introduced. This accounts for the large number with "unknown" racial/ethnic affiliation in 1973. In the absence of information to the contrary, the assumption has been made that such item non-response is randomly distributed among members of the various groups. Therefore, for examination of trends over the four years, as in the explanatory text accompanying Table I-4, the figures for each group were inflated in accordance with that assumption to take account of the number not responding to that question. The reader is cautioned, however, to use the 1973 figures with appropriate care.

Small numbers of minority Ph.D.'s: Although the Survey has obtained responses from the entire doctoral population, the numbers of minority women other than Blacks or Whites, although increasing, are still very small. Such small numbers make percentages erratic. Therefore, although the value of trend data by year is recognized, it has been necessary to combine the annual data for some tables and describe patterns for racial/ethnic groups on the basis of responses for all four years.

B. SURVEY OF DOCTORAL SCIENTISTS AND ENGINEERS

Sampling errors: The statistics presented from this survey are based on a sample and, therefore, are estimates of the population values. These estimates are subject to sampling error (see Appendix D). Where the sampling error is greater than 1 percentage point, footnotes indicate that fact and the reader should use the statistics with appropriate care. Where the text cites statistics derived from the tables but not shown in the tables, sampling errors are included in the text. Absolute standard errors are used in this report rather than relative standard errors, i.e., standard errors given as a percent of the estimated statistic, because many of the estimated percentages are small.

Non-sampling errors: The statistics derived from this study are subject to non-sampling errors in addition to the errors due to the use of a sample. The overall response rate for the 1975 survey was 69.2% (Appendix Table D-1) so the data may be subject to non-response bias since the non-respondents may differ from the respondents. A separate study of non-response bias in the 1975 Survey of Doctoral Scientists and Engineers is currently being conducted by the CHR. It can also be seen from Table D-1 that for individuals receiving the doctorate after FY 1972 the response rate for Orientals, 54.3%, and for Other minorities, 62.3%, was considerably lower than the 76.4% response rate for Whites/Caucasians. These low response rates may introduce non-response bias in the statistics for some of the characteristics of the members of these groups. They do not, however, affect the estimated numbers of Ph.D.'s in these groups because the 1975 sample was stratified by racial/ethnic group (using data from the Survey of Earned Doctorates) and the responses were weighted for the non-respondents. On the other hand, if the same low response rates obtained among the minority members receiving doctorates prior to 1973, the numbers in the population will be underestimated since the racial/ethnic data were not available for pre-1973 Ph.D.'s at the time the sample was designed and stratification by this variable was not possible.

It should be mentioned additionally that Ph.D. scientists and engineers in this country who received the doctorate at a foreign university are underrepresented in the Comprehensive Roster and, therefore, in these sample surveys.

Statistical statements in the text: Where statistical statements, i.e., statements making an inference from one or more statistics based on sample data to the corresponding population parameters, are made in the text giving the highlights of tables, all cited differences are significant at the 5 percent level unless otherwise specified. This criterion has been used in the text for Tables I-2 and I-3 and for all tables in Chapter II that are based on the Survey of Doctoral Scientists and Engineers. The various tests of significance that were used are described in Appendix D.

Sample size limits cross tabulations by sex and racial/ethnic group: The small number of minority members in the Survey of Doctoral Scientists and Engineers limits the feasibility of cross tabulation by sex and racial/ethnic group affiliation. Therefore, tables from that source generally present data by sex or by majority/minority status but not both. The need to examine each sex separately for each group to provide a more accurate description of current social change among doctorate recipients has been stressed (see pp. 1-2) but this has not been done when it would lead to excessively large sampling errors.

C. VARIABILITY OF NOMENCLATURE OF RACIAL/ETHNIC GROUPS

The variability in nomenclature of racial/ethnic groups in the tables of this report also reflects the sources of data and their limitations.

Survey of Earned Doctorates: "Chicano" and "Puerto Rican" groups can be distinguished within the Spanish-origin group in the data from the Survey of Earned Doctorates. This is a standard practice in numerous Bureau of Census publications on those of Spanish origin. As indicated previously (p. 5), these two categories contain most of the recent native-born Ph.D. recipients of Hispanic background. A report which covered all citizenship groups, including the foreign-born, would show a greater representation of other Hispanic groups such as the Cubans.

The "Asian" group for this survey consists of all individuals who checked "Oriental" on the survey form. No data are available on the origins of these individuals. They may include Hawaiians, Indonesians and others in addition to Japanese, Chinese, Koreans and Filipinos.

Survey of Doctoral Scientists and Engineers: The classification of minority individuals is even more constricted by the sample data from this survey which contains a very small number of members of minority groups. In tables presenting information from this survey, it has not been possible to distinguish different subgroups of Spanish origin. Therefore, all members of the larger category have been classified as "Hispanic", i.e., a different term is used to emphasize the different composition of the group and the different source of data.

In fact, the use of these sample data presents problems of classification with respect to all the minorities. Because sampling errors for statistics for small minority groups would be very large, it has been necessary to turn to even broader classifications in many of the tables from the Survey of Doctoral Scientists and Engineers. In a number of cases, all minorities except Asians are grouped together (including Blacks, American Indians and Hispanics). Asians are described separately because they appear in larger numbers in the Survey, because they have tended to hold higher status in comparison with the members of other minority groups and because they display a somewhat distinctive field distribution. In other instances, while distinctions between minority groups have been maintained, citizenship categories have been combined.

The "Asian" group for this survey consists of all those individuals who checked "Oriental" or "Other Asian" on the survey form.

Organization of the Report

The first chapter of the report provides data on the demographic and educational characteristics of Ph.D.'s in the 1970's. The second chapter deals with their employment patterns in 1973 and 1975. The third chapter provides information on the characteristics of the institutions that educated those who earned doctorates from 1973 to 1976.

CHAPTER 1

CHARACTERISTICS OF MINORITY AND WOMEN PH.D. RECIPIENTS

The first three tables describe the entire doctoral pool over time to provide some perspective on the proportion of Ph.D.'s who are native-born U.S. citizens. [1] Table I-1 provides data on U.S. doctorate recipients in all fields by sex and citizenship from 1958 to 1976. [2] Tables I-2 and I-3 supply similar citizenship information by racial/ethnic group and by sex for all doctoral scientists and engineers in the U.S. labor force for the cohorts from 1930 to 1974.

The remaining tables focus on native-born U.S. citizens and present data by racial/ethnic group and sex for all doctorates granted in this country from 1973 to 1976.

Table I-4 shows the distribution of doctorates by racial/ethnic group and sex from 1973 to 1976.

Tables I-5 through I-10 provide information on the background characteristics of doctorate recipients: region of birth, father's education, mother's education, age at Ph.D., marital status and number of dependents. Marriage and dependents are examined because both marriage and children have been perceived as barriers to women's educational and career development.

Tables I-11 through I-13 describe the fields of Ph.D.'s: distribution by fields, the baccalaureate sources of doctorates of different fields, and the relationship between father's education and field.

Many universities and corporations have used data on women and minority Ph.D.'s by fine field in developing personnel plans. Although time did not allow analysis of fine field data in this report, tables on fine field of Ph.D. by citizenship and by racial/ethnic group for all doctorate recipients and for women doctorate recipients, for 1973-1976, are included as appendices A and B for the convenience of the reader.

---

[1] The cohort years referred to in these tables are fiscal years.
[2] Data on racial/ethnic affiliation are not available for the years before 1973 (see page 8).

Tables I-14 through I-16 describe the graduate educational history of doctorates including age at Ph.D., time elapsed between receipt of the baccalaureate and graduate school enrollment, years out of school between the beginning of graduate work and the doctorate and sources of graduate support.

Finally, Table I-17 presents the postdoctoral plans of doctorates at the time the degree is awarded.

Tables I-2 and I-3 are derived from the Comprehensive Roster Survey and are limited to doctoral scientists and engineers. Because these are survey data, the statistics that are presented are estimates that are subject to sampling error (see Appendix D). All the other tables of this chapter are taken from the Survey of Earned Doctorates which covers virtually the entire population in all fields so that sampling error is not involved.

It will be noted in the tables in which data are presented by citizenship that the two data sources have different classifications. Thus, the Survey of Earned Doctorates lists native-born U.S. citizens, foreign-born U.S. citizens, foreign citizens with immigrant visas and foreign citizens with temporary visas. The Comprehensive Survey. however. does not distinguish between the tyoes of visas held by foreign citizens so that data from this source compare native-born U.S. citizens, foreign-born U.S. citizens and foreign citizens.

Table I-1
Citizenship/Place of Birth and Sex of Ph.D. Recipients by Fiscal Year of Degree, 1958-1976 1/

Fiscal Year of Ph.D.	Native-Born U.S. Citizens			Foreign-Born U.S. Citizens			Foreign Citizens Immigrant Visas			Foreign Citizens Temporary Visas			Other & Unknown			Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	All
1958	88.8%	11.2%	7,285	86.4%	13.6%	413	88.7%	11.3%	248	90.4%	9.6%	627	85.0%	15.0%	200	88.7%	11.3%	8,773
1959	89.4	10.6	7,557	84.5	15.5	477	92.8	7.2	293	92.1	7.9	773	85.8	14.2	113	89.4	10.6	9,213
1960	89.4	10.6	7,923	86.1	13.9	496	88.9	11.1	279	90.5	9.5	897	84.8	15.2	138	89.3	10.7	9,733
1961	89.2	10.8	8,441	86.0	14.0	484	89.5	10.5	256	91.0	9.0	1,050	86.3	13.7	182	89.2	10.8	10,413
1962	89.3	10.7	9,248	82.5	17.5	560	89.4	10.6	274	91.8	8.2	1,244	87.9	12.1	174	89.3	10.7	11,500
1963	88.9	11.1	10,308	85.2	14.8	573	90.7	9.3	354	91.5	8.5	1,251	91.4	8.6	244	89.1	10.9	12,730
1964	89.2	10.8	11,382	84.5	15.5	653	89.7	10.3	468	91.4	8.6	1,463	85.2	14.8	359	89.1	10.9	14,325
1965	89.3	10.7	12,990	82.9	17.1	683	89.1	10.9	560	93.0	7.0	1,753	81.1	18.9	355	89.2	10.8	16,341
1966	88.4	11.6	14,106	82.1	17.9	765	89.2	10.8	636	91.3	8.7	1,908	85.8	14.2	534	88.4	11.6	17,949
1967	87.9	12.1	16,495	81.9	18.1	537	90.5	9.5	876	90.3	9.7	2,048	86.4	13.6	450	88.0	12.0	20,406
1968	86.9	13.1	18,501	82.9	17.1	726	86.4	13.6	1,046	91.7	8.3	2,269	87.9	12.1	396	87.2	12.8	22,938
1969	86.6	13.4	20,683	78.0	22.0	856	88.6	11.4	1,235	90.8	9.2	2,334	88.6	11.4	638	86.8	13.2	25,746
1970	86.3	13.7	23,991	78.1	21.9	922	86.8	13.2	1,577	91.4	8.6	2,573	87.2	12.8	437	86.5	13.5	29,500
1971	85.2	14.8	25,814	77.7	22.3	946	87.1	12.9	1,907	91.4	8.6	2,690	85.7	14.3	516	85.6	14.4	31,873
1972	83.4	16.6	26,484	77.2	22.8	993	85.4	14.6	2,094	90.9	9.1	2,831	85.7	14.3	642	84.0	16.0	33,044
1973	81.1	18.9	26,824	72.9	27.1	1,088	85.4	14.6	1,997	90.6	9.4	3,173	82.0	18.0	673	82.0	18.0	33,755
1974	79.5	20.5	25,267	71.5	28.5	1,060	84.3	15.7	1,826	89.6	10.4	3,355	78.4	21.6	1,540	80.5	19.5	33,048
1975	76.5	23.5	25,989	70.8	29.2	1,074	82.7	17.3	1,714	90.0	10.0	3,534	79.1	20.9	636	78.1	21.9	32,947
1976	75.1	24.9	26,083	69.9	30.1	1,112	80.6	19.4	1,491	88.4	11.6	3,518	78.2	21.8	719	76.7	23.3	32,923
Total 1958-1976 H%	84.2	15.8	325,371 79.9%	78.5	21.5	14,418 3.5%	86.2	13.8	19,131 4.7%	90.7	9.3	39,291 9.7%	83.5	16.5	8,946 2.2%	84.7	15.3	407,157 100.0%

1/ 1958 was the first year the individual Ph.D.'s were surveyed.

Source: Survey of Earned Doctorates, National Research Council

I-1 Citizenship/Place of Birth and Sex of Ph.D. Recipients by Fiscal Year of Degree, 1958-1976

Differences by Citizenship/Place of Birth

During the period 1958-1976, 407,157 doctorates were awarded in the United States. Of these 325,371, or 79.9%, were awarded to native-born U.S. citizens. During this period 39,291 doctorates, nearly 10% of the total, were awarded to foreign citizens on temporary visas. By comparing the total column for foreign citizens-temporary visas with the Total-All column, it is easy to see that the foreign Ph.D.'s with temporary visas were more than 10% of the total in 1961, 1962, 1964-1967 and 1974-1976. In the last three years there were 10,407 foreign citizens with temporary visas or 10.5% of the total of 98,918 for the three years. During the period 1972-1976 the total number of Ph.D.'s has been fairly stable--around 33,000 each year. The number of foreign citizens with immigrant visas decreased steadily, however, during this period from 2,094 to 1,491. Conversely, the number of foreign citizens with temporary visas increased from 2,831 in 1972 to 3,518 in 1976.

Sex Differences within Citizenship/Place of Birth Categories

Among the four citizenship categories, the naturalized U.S. citizens have consistently shown the largest proportion of female doctorates and native-born U.S. citizens have shown the second highest proportion. The foreign citizens group has had the lowest percent of female Ph.D.'s and among foreign citizens, those with temporary visas have had the lowest proportion of all groups. It is possible that in sending students to this country to study, there is some selectivity by sex.

The increase in percentage of women doctorates is apparent in all citizenship groups but began at different times, starting with native-born U.S. citizens in 1966 and among those with temporary visas in 1974.

Table I-2a
Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/ Place of Birth, Fiscal Year of Doctorate and Racial/Ethnic Group, 1930-1974 (Number and Percent)

Total Reporting Citizenship

Racial/Ethnic Group

Fiscal Year of Doctorate		White	Black	Amer. Indian	Hispanic[1]	Asian	Total Reptd.	Other & Unk.	Total All
1930-34	N[2]	786	3			6	795	47	842
	WN[3]	4832	18			32	4882	301	5183
	H[4]	99.0	.4			.7	100.0		
1935-39	N	1048	3		1	8	1060	52	1112
	WN	6346	20		10	40	6416	317	6733
	H	98.9	.3		.2	.6	100.0		
1940-44	N	1323	8		2	17	1350	76	1426
	WN	7770	54		9	95	7928	408	8336
	H	98.0	.7		.1	1.2	100.0		
1945-49	N	1451	12	1	5	31	1500	70	1570
	WN	8656	66	5	29	193	8949	374	9323
	H	96.7	.7	.1	.3	2.2	100.0		
1950-54	N	3074	21	1	11	84	3191	127	3318
	WN	22686	139	12	71	589	23497	904	24401
	H	96.5	.6	.1	.3	2.5	100.0		
1955-59	N	3695	38	7	10	131	3881	167	4048
	WN	26245	277	51	46	839	27458	1185	28643
	H	95.6	1.0	.2	.2	3.1	100.0		
1960-64	N	5872	60	11	21	339	6303	337	6640
	WN	36021	326	73	106	1928	38454	2072	40526
	H	93.7	.8	.2	.3	5.0	100.0		
1965-69	N	8066	102	19	40	515	8742	390	9132
	WN	56076	586	139	243	3602	60646	2682	63328
	H	92.5	1.0	.3	.4	5.9	100.0		
1970-74	N	9520	303	46	129	1051	11049	420	11469
	WN	77523	1078	169	455	6090	85315	3151	88466
	H	90.9	1.3	.2	.5	7.1	100.0		

[1] Hispanic refers to all those of Spanish origin (see p. 12) for all tables from this source.

[2] N = number of respondents in the sample

[3] WN = estimated number in the population, i.e., N inflated for non-response and for sampling rate

[4] H = horizontal percentage based on total reported

Source: Survey of Doctoral Scientists and Engineers, National Research Council

I-2 Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/Place of Birth, Fiscal Year of Doctorate and Racial/Ethnic Group, 1930-1974

Racial/Ethnic Group Differences

In the 1930-1934 doctoral cohort group in all citizenship categories there were 32 Asians, or 0.7% of the 4,882 doctoral scientists and engineers in the United States of known racial/ethnic group affiliation. In the first half of the 1970's, they numbered 6,090 or 7.1% of the total figure of 85,315. 1/ The members of other minority groups have continued to represent a very small fraction of the pool of scientists.

Citizenship Differences

A comparison of the composition by citizenship of the 1930-1934 cohorts of the Ph.D.'s in the U.S. labor force with the 1970-1974 cohorts is interesting. In the 1930-1934 cohorts of 5,183 Ph.D.'s with known citizenship status, 4,323 or 83.4% ± 1.3% were native-born citizens (see table I-2b) compared with 76,516 or 86.5% ± 0.3% of the 88,466 in the 1970-1974 cohorts. This proportion ranges between 82.6% and 86.5% for all cohort groups except those of the World War II period when 7,438 of a total 8,336 or 89.2% ± 0.8% were native-born U.S. citizens. Foreign-born U.S. citizens (see Table I-2c) have become a smaller proportion of cohort groups over time. The 812 in the 1930-1934 cohorts were 15.7% ± 1.2% of the total of 5,183 but 4,796 in the 1970-1974 cohorts were only 5.4% ± 0.2% of the total of 88,466. In striking contrast, the 48 foreign citizens (see Table I-2d) in the 1930-1934 cohort were less than 1% ± 0.3% of the 5,183 in the cohort group whereas the 7,154 in the 1970-1974 group constituted 8.1% ± 0.3% of the total 88,466.

Citizenship Differences within Racial/Ethnic Groups

The total minority percent of scientists and engineers increased among the native-born from 0.5% ± 0.3% in the 1930's to 2.6% ± 0.2% in the 1970's. Among naturalized citizens, the increase was from 2.8% ± 1.2% to 36.4% ± 1.9% and among foreign citizens, from 14.3% ± 11.7% to 62.2% ± 1.4%. Expanded minority representa-

---

1/ It should be stressed that these data include only science and engineering, fields in which Asians are concentrated (see Table I-11) tion is associated with the large increase in Asian representation among both U.S. immigrants and recipients of non-immigrant visas in the 1970's (U.S. Bureau of the Census, 1976b, pp. 104 and 108). Asians are thus the only racial/ethnic group in the 1970-1974 cohort group of the doctoral labor force in which foreign citizens outnumber native-born and foreign-born U.S. citizens combined.

Table I-2b
Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/ Place of Birth, Fiscal Year of Doctorate and Racial/Ethnic Group, 1930-1974
(Number and Percent)

Native-Born U.S. Citizens

Fiscal Year of Doctorate		Racial/Ethnic Group White	Black	Amer. Indian	His-panic	Asian	Total Reptd.	Other & Unk.	Total All
1930-34	N	585	3			1	589	37	626
	WN	4048	18			6	4072	251	4323
	H	99.4	.4			.1	100.0		
1935-39	N	824	3		1		828	46	874
	WN	5441	20		10		5471	301	5772
	H	99.5	.4		.2		100.0		
1940-44	N	1113	8		1	3	1125	63	1188
	WN	7005	54		6	20	7085	353	7438
	H	98.9	.8		.1	.3	100.0		
1945-49	N	1118	12	1	2	8	1141	48	1189
	WN	7266	66	5	10	63	7410	288	7698
	H	98.1	.9	.1	.1	.9	100.0		
1950-54	N	2546	20	1	8	22	2597	96	2693
	WN	19559	135	12	63	138	19907	706	20613
	H	98.3	.7	.1	.3	.7	100.0		
1955-59	N	3101	34	7	8	23	3173	136	3309
	WN	22583	247	51	43	164	23088	973	24061
	H	97.8	1.1	.2	.2	.7	100.0		
1960-64	N	4979	55	10	18	39	5101	276	5377
	WN	31034	302	65	89	228	31718	1746	33464
	H	97.8	1.0	.2	.3	.7	100.0		
1965-69	N	7198	90	19	34	43	7384	311	7695
	WN	50620	512	139	204	307	51782	2148	53930
	H	97.8	1.0	.3	.4	.6	100.0		
1970-74	N	8767	269	45	94	113	9288	317	9605
	WN	72090	962	168	322	510	74052	2464	76516
	H	97.4	1.3	.2	.4	.7	100.0		

Source: Survey of Doctoral Scientists and Engineers, National Research Council

Table I-2c

Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/Place of Birth, Fiscal Year of Doctorate and Racial/Ethnic Group, 1930-1974 (Number and Percent)

Foreign-Born U.S. Citizens

Racial/Ethnic Group

Fiscal Year of Doctorate		White	Black	Amer. Indian	Hispanic	Asian	Total Reptd.	Other & Unk.	Total All
1930-34	N	193				4	197	7	204
	WN	760				22	782	30	812
	H	97.2[a]				2.8[a]	100.0		
1935-39	N	209				8	217	6	223
	WN	864				40	904	16	920
	H	95.6[a]				4.4[a]	100.0		
1940-44	N	196			1	12	209	12	221
	WN	724			3	70	797	51	848
	H	90.8[a]			.4	8.8[a]	100.0		
1945-49	N	293			2	21	316	18	334
	WN	1258			16	117	1391	75	1466
	H	90.4[a]			1.2	8.4[a]	100.0		
1950-54	N	417			2	54	473	28	501
	WN	2597			6	418	3021	175	3196
	H	86.0[a]			.2	13.8[a]	100.0		
1955-59	N	420	3		2	70	495	21	516
	WN	2718	26		3	480	3227	139	3366
	H	84.2[a]	.8		.1	14.9[a]	100.0		
1960-64	N	568	3	1	2	203	777	35	812
	WN	3265	14	8	15	1184	4486	195	4681
	H	72.8[a]	.3	.2	.3	26.4[a]	100.0		
1965-69	N	478	4		3	286	771	46	817
	WN	3143	24		18	2013	5198	310	5508
	H	60.5[a]	.5		.3	38.7[a]	100.0		
1970-74	N	364	8	1	22	254	649	40	689
	WN	2891	19	1	76	1559	4546	250	4796
	H	63.6[a]	.4		1.7	34.3[a]	100.0		

[a] Sampling error between 1 and 5 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

Table I-2d

Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/Place of Birth, Fiscal Year of Doctorate and Racial/Ethnic Group, 1930-1974 (Number and Percent)

Foreign Citizens

Racial/Ethnic Group

Fiscal Year of Doctorate		White	Black	Amer. Indian	His-panic	Asian	Total Reptd.	Other & Unk.	Total All
1930-34	N	8				1	9	3	12
	WN	24				4	28	20	48
	H	85.7[c]				14.3[c]	100.0		
1935-39	N	15					15		15
	WN	41					41		41
	H	100.0					100.0		
1940-44	N	14				2	16	1	17
	WN	41				5	46	4	50
	H	89.1[b]				10.9[b]	100.0		
1945-49	N	40			1	2	43	4	47
	WN	132			3	13	148	11	159
	H	89.2[a]			2.0[a]	8.8[a]	100.0		
1950-54	N	111	1		1	8	121	3	124
	WN	530	4		2	33	569	23	592
	H	93.1[a]	.7		.4	5.8[a]	100.0		
1955-59	N	174	1			38	213	10	223
	WN	944	4			195	1143	73	1216
	H	82.6[a]	.3			17.1[a]	100.0		
1960-64	N	325	2		1	97	425	26	451
	WN	1722	10		2	516	2250	131	2381
	H	76.5[a]	.4		.1	22.9[a]	100.0		
1965-69	N	390	8		3	186	587	33	620
	WN	2313	50		21	1282	3666	224	3890
	H	63.1[a]	1.4		.6	35.0[a]	100.0		
1970-74	N	389	26		13	684	1112	63	1175
	WN	2542	97		57	4021	6717	437	7154
	H	37.8[a]	1.4		.8	59.9[a]	100.0		

[a] Sampling error between 1 and 5 percentage points
[b] Sampling error between 5 and 10 percentage points
[c] Sampling error greater than 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

Table I-3

Doctoral Scientists and Engineers in the U.S. Labor Force by Year of Doctorate, Sex and Citizenship/Place of Birth, 1930-1974 (Number and Percent)

Fiscal Year of Ph.D.		Native-Born U.S. Citizens			Foreign-Born U.S. Citizens			Foreign Citizens			Citizenship Unknown		
		MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
1930-34	N	501	125	626	173	31	204	11	1	12	48	25	73
	WN	3844	479	4323	725	87	812	45	3	48	338	105	443
	H	88.9[a]	11.1[a]	100.0	89.3[a]	10.7[a]	100.0	93.8[b]	6.3[b]	100.0	76.3[a]	23.7[a]	100.0
1935-39	N	713	161	874	188	35	223	12	3	15	78	25	103
	WN	5170	602	5772	841	79	920	33	8	41	533	118	651
	H	89.6[a]	10.4[a]	100.0	91.4[a]	8.6[a]	100.0	80.5[c]	19.5[c]	100.0	81.9[a]	18.1[a]	100.0
1940-44	N	998	190	1188	193	28	221	14	3	17	46	26	72
	WN	6862	576	7438	788	60	848	43	7	50	270	82	352
	H	92.3	7.7	100.0	92.9[a]	7.1[a]	100.0	86.0[b]	14.0[b]	100.0	76.7[a]	23.3[a]	100.0
1945-49	N	969	220	1189	288	46	334	41	6	47	59	22	81
	WN	6999	699	7698	1332	134	1466	148	11	159	397	77	474
	H	90.9	9.1	100.0	90.9[a]	9.1[a]	100.0	93.1[a]	6.9[a]	100.0	83.8[a]	16.2[a]	100.0
1950-54	N	2376	317	2693	448	53	501	107	17	124	102	35	137
	WN	19373	1240	20613	2978	218	3196	548	44	592	845	149	994
	H	94.0	6.0	100.0	93.2[a]	6.8[a]	100.0	92.6[a]	7.4[a]	100.0	85.0[a]	15.0[a]	100.0
1955-59	N	2822	487	3309	433	83	516	189	34	223	64	19	83
	WN	22356	1705	24061	3105	261	3366	1124	92	1216	532	83	615
	H	92.9	7.1	100.0	92.2[a]	7.8[a]	100.0	92.4[a]	7.6[a]	100.0	86.5[a]	13.5[a]	100.0
1960-64	N	4359	1018	5377	633	179	812	377	74	451	11	5	16
	WN	31102	2362	33464	4262	419	4681	2208	173	2381	73	12	85
	H	92.9	7.1	100.0	91.0[a]	9.0[a]	100.0	92.7[a]	7.3[a]	100.0	85.9[b]	14.1[b]	100.0
1965-69	N	6098	1597	7695	641	176	817	525	95	620	23	10	33
	WN	49127	4803	53930	5011	497	5508	3625	265	3890	161	31	192
	H	91.1	8.9	100.0	91.0[a]	9.0[a]	100.0	93.2[a]	6.8[a]	100.0	83.9[b]	16.1[b]	100.0
1970-74	N	7227	2378	9605	495	194	689	889	286	1175	52	21	73
	WN	67171	9345	76516	4154	642	4796	6379	775	7154	426	69	495
	H	87.8	12.2	100.0	86.6[a]	13.4[a]	100.0	89.2	10.8	100.0	86.1[a]	13.9[a]	100.0

a Sampling error between 1 and 5 percentage points
b Sampling error between 5 and 10 percentage points
c Sampling error greater than 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

I-3 Doctoral Scientists and Engineers in the U.S. Labor Force by Year of Doctorate, Sex and Citizenship/Place of Birth, 1930-1974

Sex Differences

The percentage of women scientists and engineers is very small for all cohorts although the first half of the 1970's saw a slight increase. This was due, in part, to a decline in the number of men in these fields (Gilford and Syverson, 1977a, p. 4). For the 1970-1974 cohort, the percent of women entering the labor force of scientists and engineers was 12.2% ± 0.3%. This contrasts with their representation among doctorates awarded by U.S. universities in all fields which increased from 13.5% in 1970 to 19.5% in 1974 (see Table I-1).

Sex Differences within Citizenship Groups

Among native-born U.S. citizens, the percentage of women doctorates for the 1930-1934 cohort was larger than the combined cohorts for 1940-1969. The 1930-1934 cohort figure was matched again in the 1970-1974 period. Although the foreign-born U.S. citizens appear to follow a similar pattern, the differences in percentages for the two cohort periods are generally not significant because of the smaller sample sizes. The proportion of women doctorates is quite similar for all citizenship groups. In the category, "citizenship unknown" a consistently higher (although not always significantly higher) estimated percentage of doctoral scientists and engineers has been women but no explanation for this is available.

Table I-4

Native-Born U.S. Citizens Who Received the Doctorate in Fiscal Years 1973-1976 by Sex and Racial/Ethnic Group (Number and Percent)

Racial/ Ethnic Group	Men				Women			
	Year				Year			
	1973	1974	1975	1976	1973	1974	1975	1976
White	16,018 95.7% 1/	17,916 95.1%	18,030 94.6%	17,744 94.4%	3,757 94.4%	4,562 92.7%	5,446 92.4%	5,717 90.8%
Black	427 2.6%	560 3.0%	630 3.3%	636 3.4%	150 3.8%	259 5.3%	339 5.8%	429 6.8%
American Indian	84 .5%	98 .5%	112 .6%	110 .6%	24 .6%	23 .5%	31 .5%	35 .6%
Chicano 2/	78 .5%	123 .7%	147 .8%	166 .9%	16 .4%	25 .5%	29 .5%	40 .6%
Puerto 2/ Rican	29 .2%	38 .2%	48 .3%	40 .2%	7 .2%	17 .3%	14 .2%	25 .4%
Asian	99 .6%	108 .6%	94 .5%	99 .5%	24 .6%	33 .7%	36 .6%	50 .8%
Total Reported	16,735 100.1%	18,843 100.1%	19,061 100.1%	18,795 100.0%	3,978 100.0%	4,919 100.0%	5,895 100.0%	6,296 100.0%
Other and Unknown	5,012	1,242	827	801	1,099	263	206	191
Total	21,747	20,085	19,888	19,596	5,077	5,182	6,101	6,487

1/ Vertical percentages of total reported (excluding other and unknown)

2/ The Spanish-origin group can be subdivided into the Chicano and Puerto Rican groups when data from this source are used.

Source: Survey of Earned Doctorates, National Research Council

I-4 Native-Born U.S. Citizens Who Received the Doctorate in Fiscal Years 1973-1976 by Sex and Racial/Ethnic Group

Racial/Ethnic Group Differences

There was an overall increase in the percentage of minority Ph.D. recipients of both sexes from 4.5% in 1973 to 6.5% in 1976.

Sex Differences

The total number of male doctorate recipients showed a drop over the four years while the total number of women increased.

Sex Differences Within Racial/Ethnic Groups

The increase in minority degree recipients was much greater among women than among men. Thus, minority men were 4.3% of all men in 1973 and 5.6% in 1976, while minority women constituted 5.6% of all women in 1973 and 9.2% in 1976.

Although the total numbers of male Ph.D.'s decreased over the past four years, the number of Black male Ph.D.'s increased by 20% while Chicano men showed an increase of over 69%. 1/ In all groups, women increased in numbers. Except for American Indians, minority women showed a greater rate of increase than White women.

The smallest sex difference in percentage of Ph.D.'s is now found among Blacks, followed by Puerto Ricans and Asians. In each of these groups, women received at least one-third of the Ph.D.'s in 1976. The largest discrepancy is found among Chicanos where only 19.4% of the doctorate recipients were women. Both male and female Chicanos showed a high rate of increase from 1973 to 1976. The increase for Black women has been anticipated by a number of researchers (Bock, 1969; Carnegie Commission on Higher Education, 1973b; Epstein, 1973; Harris, 1973). However, the figures of Table I-4 show substantial increases among women of groups such as Chicanos, Puerto Ricans and Asians that have not traditionally stressed education for women.

1/ It is assumed that 1048 cases properly belonged in the unknown category, since this number corresponds to the portion in this category in 1974-1976. The 1973 numbers for the racial/ethnic groups have been inflated to account for the remaining 3964 cases in the other and unknown category.

Table I-5
Doctorate Recipients by Region of Birth by Racial/Ethnic Group and Sex, 1973-1976 (Number and Percent of Racial/Ethnic Group)

Region of Birth	MEN								WOMEN							
	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Northeast	22,292	275	54	28	27	42	2,644	25,362	6,861	154	12	10	11	21	630	7,699
	32.4%	12.3%	13.6%	5.6%	17.5%	11.1%	34.9%	31.7%	35.7%	13.2%	10.7%	9.2%	17.7%	15.0%	37.6%	34.2%
South	15,333	1,560	172	166	2	12	1,590	18,835	4,604	802	57	39	1	6	386	5,895
	22.3	70.0	43.2	33.1	1.3	3.2	21.0	23.5	23.9	68.8	50.9	35.8	1.6	4.3	23.0	26.2
North Central	21,997	330	92	32	3	39	2,225	24,718	5,720	180	26	7	1	15	474	6,423
	31.9	14.8	23.1	6.4	1.9	10.3	29.4	30.9	29.7	15.4	23.2	6.4	1.6	10.7	28.3	28.5
West	9,249	62	80	276	122	285	1,114	11,188	2,049	30	17	53	49	98	187	2,483
	13.4	2.8	20.1	55.0	79.2	75.4	14.7	14.0	10.7	2.6	15.2	48.6	79.0	70.0	11.2	11.0
West Minus Puerto Rico	9,240	62	80	275	1	285	1,102	11,045	2,045	29	17	52	-	98	176	2,418
	13.4	2.8	20.1	54.8	0.6	75.4	14.6	13.8	10.6	2.5	15.2	47.7		70.0	10.5	10.7
Puerto Rico	9	-	-	1	121	-	12	143	4	-	-	1	49	-	11	65
	.01			0.2	78.6		0.2	0.2	.02			0.9	79.0		0.7	0.3
Total	68,871	2,227	398	502	154	378	7,573	80,103	19,234	1,166	112	109	62	140	1,677	22,500
	100.0	99.9	100.0	100.1	99.9	100.0	100.0	100.1	100.0	100.0	100.0	100.0	99.9	100.0	100.1	99.9

Source: Survey of Earned Doctorates, National Research Council

I-5 Doctorate Recipients by Region of Birth, by Racial/Ethnic Group and Sex, 1973-1976

Racial/Ethnic Group Differences

Minority Ph.D.'s have come largely from the regions where their groups have been located historically: Blacks from the South, Chicanos and Asians from the West, Puerto Ricans from Puerto Rico, American Indians from the South (here including Oklahoma, the state with the largest American Indian population). The areas producing the largest proportions of the White Ph.D.'s, however, are the Northeast and North Central Regions. Given the average age of Ph.D. recipients and the fact that Black Ph.D.'s are overwhelmingly of southern origin, indications are that the vast majority experienced at least some part of their education under formal systems of segregation. The regions of origin of the Chicanos and Puerto Ricans suggest that the majority may have spent some part of their lives in Spanish-speaking areas although data are not available on language.

Sex Differences

The Northeast and the South have produced higher proportions of the total female Ph.D.'s than of the total male Ph.D.'s, while the other regions have yielded lower proportions.

Sex Differences within Racial/Ethnic Groups

In all groups except American Indians, the Northeast has produced a higher proportion of total female Ph.D.'s than the proportion of total male Ph.D.'s. In every group except Blacks, the South shows a higher proportion of total female Ph.D.'s than its proportion of total male Ph.D.'s The West minus Puerto Rico shows a lower proportion of total female than of total male Ph.D.'s for every group.

Table I-6
Percentage Distribution of Doctorate Recipients 1/ by Education of Father, by Sex and Racial/Ethnic Group, 1973-1976 (Percent of Total Reported)

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Level of Education	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
0-6 yrs	6.2%	22.3%	10.8%	39.0%	25.7%	12.5%	6.7%	7.0%	5.0%	17.1%	9.9%	32.1%	12.3%	9.0%	6.9%	5.9%
7-11 yrs	22.4	34.8	26.8	24.3	19.3	18.8	23.4	22.8	18.2	27.9	29.7	17.0	17.5	17.9	20.0	18.8
Did not complete High School	(28.6)	(57.1)	(37.6)	(63.3)	(45.0)	(31.3)	(30.1)	(29.8)	(23.2)	(45.0)	(39.6)	(49.1)	(29.8)	(26.9)	(26.9)	(24.7)
High School or some College (12-15 yrs)	40.6	29.7	38.8	24.9	37.1	39.3	38.6	40.1	36.5	32.8	36.6	32.1	35.1	29.1	34.2	36.1
4 years of College	15.7	6.5	11.3	5.7	11.4	16.3	15.7	15.4	19.9	10.8	14.9	8.5	21.1	19.4	19.4	19.4
5 or more years of College	15.0	6.7	12.3	6.1	6.4	13.0	15.6	14.8	20.3	11.5	8.9	10.4	14.0	24.6	19.5	19.8
At least 4 years of College	(30.7)	(13.2)	(23.6)	(11.8)	(17.8)	(29.3)	(31.3)	(30.2)	(40.2)	(22.3)	(23.8)	(18.9)	(35.1)	(44.0)	(38.9)	(39.2)
Total Reported	65,879	1,983	381	474	140	361	6,074	75,292	18,323	1,059	101	106	57	134	1,288	21,068
Unknown	3,829	270	23	40	15	39	1,808	6,024	1,159	118	12	4	6	9	471	1,779

1/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

I-6 Percentage Distribution of Doctorate Recipients by Education of Father, by Sex and Racial/Ethnic Group, 1973-1976

Racial/Ethnic Group Differences

Among the doctorate recipients in 1973-1976, Whites and Asians of both sexes have the largest proportion of fathers with at least four years of college and the smallest proportion who have not completed high school. Chicano doctorate recipients, both men and women, have the largest proportion of fathers who have not completed high school and the smallest proportion with at least four years of college.

Sex Differences

In general, the educational level of the fathers of female Ph.D.'s is higher than the educational level of the fathers of male doctorate recipients. Among the fathers of male Ph.D.'s, 30.2% have at least four years of college education while the fathers of female doctorate recipients show a percentage of 39.2% with college degrees. It has been pointed out that the higher the educational level of parents, the less likely they are to distinguish between the educational needs of their sons and daughters (Carnegie Commission on Higher Education, 1973b, p. 41).

Sex Differences within Racial/Ethnic Groups

The largest sex differences are found in the Puerto Rican group in which a much higher proportion of men than women has fathers who have not completed high school. In this group, 35.1% of female Ph.D.'s have fathers who have completed at least four years of college and 17.8% of male doctorate recipients' fathers have done so. The smallest differences appear in the American Indian group where there is a reversal of the pattern for all other groups. Among their female doctorate recipients, a slightly higher proportion of fathers is distributed along the lower end of the educational scale than among male doctorate recipients.

Table I-7
Percentage Distribution of Doctorate Recipients[1/] by Education of Mother, by Sex and Racial/Ethnic Group, 1973-1976 (Percent of Total Reported)

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Level of Education	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
0-6 yrs	2.9%	11.1%	7.3%	30.1%	27.9%	11.8%	3.6%	3.5%	2.6%	6.2%	2.0%	28.3%	15.8%	15.8%	3.7%	3.1%
7-11 yrs	18.0	35.3	26.2	30.3	22.9	19.7	19.1	18.7	15.8	28.1	23.5	28.3	21.1	16.5	17.3	16.6
Did not complete High School	(20.9)	(46.4)	(33.5)	(60.4)	(50.8)	(31.5)	(22.7)	(22.2)	(18.4)	(34.3)	(25.5)	(56.6)	(36.9)	(32.3)	(21.0)	(19.7)
High School or some College (12-15 yrs)	57.7	39.1	49.0	33.1	35.0	51.5	54.3	56.7	52.3	39.1	49.0	31.1	36.8	37.6	50.9	51.3
4 years of College	15.2	8.3	9.2	4.8	7.9	11.2	15.6	14.9	19.4	16.5	11.8	5.7	14.0	17.3	18.5	19.1
5 or more years of College	6.2	6.1	8.4	1.7	6.4	5.8	7.4	6.3	9.9	10.1	13.7	6.6	12.3	12.8	9.6	9.9
At least 4 years of College	(21.4)	(14.4)	(17.6)	(6.5)	(14.3)	(17.0)	(23.0)	(21.2)	(29.3)	(26.6)	(25.5)	(12.3)	(26.3)	(30.1)	(28.1)	(29.0)
Total Reported	66,002	2,002	382	478	140	365	6,095	75,464	18,436	1,073	102	106	57	133	1,292	21,199
Unknown	3,706	251	22	36	15	35	1,787	5,852	1,046	104	11	4	6	10	467	1,648

[1/] Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

I-7 Percentage Distribution of Doctorate Recipients by Education of Mother, by Sex and Racial/Ethnic Group, 1973-1976

Racial/Ethnic Group Differences

Among the doctorate recipients in 1973-1976, Whites of both sexes show the smallest proportions of mothers lacking high school diplomas. Chicanos, both men and women, show the highest percents of mothers who have not completed secondary education, 60.4% and 56.6%, respectively, and the lowest percentages of mothers with four years of college or more.

Sex Differences

In every group except the Asians, the proportion of mothers who have not finished high school is higher for male Ph.D.'s than for female Ph.D.'s. In every group, a higher percentage of the mothers of women doctorate recipients than of men doctorate recipients has completed at least four years of college.

Sex Differences within Racial/Ethnic Groups

Blacks and Puerto Ricans show large differences between the mothers of male and female degree recipients at both ends of the educational continuum. In both groups, much smaller proportions of mothers of women Ph.D.'s than of men Ph.D.'s have not completed high school and much larger proportions have college degrees. Differences between the mothers of the two sexes are relatively small among Chicanos where they are concentrated in the categories with low educational attainment.

Table I-8
Age at Ph.D. 1/ of Doctorate Recipients 2/ by Sex and Racial/Ethnic Group, 1973-1976 (Percent of Total Reported)

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Age at Ph.D.	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Under 25	0.3%	0.2%	-	-	0.6%	0.8%	0.5%	0.3%	0.4%	0.1%	-	-	-	-	0.6%	0.4%
25-29	36.0	15.9	25.0	25.3	29.9	43.5	37.2	35.5	31.5	18.0	22.1	17.3	28.6	40.8	31.5	30.7
30-34	35.2	26.8	34.7	34.4	29.2	28.5	34.9	34.9	28.6	22.3	23.9	31.8	25.4	26.8	27.3	28.1
35-39	14.7	23.6	19.1	18.5	18.8	16.0	14.3	15.0	14.6	18.8	22.1	21.8	12.7	11.3	14.6	14.8
40-44	7.5	17.7	10.6	13.2	11.7	6.5	7.7	7.8	10.3	18.0	13.3	11.8	12.7	7.7	10.5	10.7
45-49	4.0	9.2	7.2	5.6	3.2	3.3	3.3	4.1	7.4	10.8	10.6	11.8	12.7	7.0	7.6	7.6
50 or more	2.4	6.5	3.5	2.9	6.5	1.5	2.1	2.5	7.2	11.9	8.0	5.5	7.9	6.3	7.7	7.5
Total Reported	69,669	2,250	404	514	154	400	7,857	81,248	19,464	1,173	113	110	63	142	1,756	22,821
Unknown	39	3	-	-	1	-	25	68	18	4	-	-	-	1	3	26
Median Age at Ph.D.	31.0	36.0	32.9	32.8	32.9	30.2	30.8	31.1	32.3	37.2	35.6	34.8	33.3	30.8	32.2	32.5

1/ Age to nearest year
2/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

I-8 Age at Ph.D.[1][2] of Doctorate Recipients by Sex and Racial/Ethnic Group, 1973-1976

Racial/Ethnic Group Differences

Asians have the lowest median age of all groups at the time they complete the doctorate. Whites are next with the other groups following and Blacks having the highest median age when they obtain the Ph.D.

Sex Differences

On the whole, women obtain the Ph.D. later than men. Several studies have shown the medians for the two sexes to be similar but the range for women is much greater (Astin, 1969, pp. 19-20; Carnegie, 1973b, p. 83; Centra, 1974, pp. 22-24). In Table I-13, the percentage of men receiving the degree before the age of 35 is higher than that of women, the proportions for the two sexes are virtually identical for the years from 35 to 39, and the proportion of men who receive the Ph.D. at ages 40 and later is lower than for women. Of the men, 2.5% receive the degree at the age of 50 or later and among women, 7.5%. Some factors in the age difference between the sexes are indicated by the next tables on time elapsed between the completion of the baccalaureate and entrance into graduate school and on years out of school between graduate school enrollment and the completion of the doctorate.

Sex Differences within Racial/Ethnic Groups

The difference in the median age of men and women at the time they complete the degree is smallest among Puerto Ricans, followed closely by the Asian group. It is largest in the American Indian group in which the median age for men at the time of the degree is 32.9 and for women, 35.6.

---

[1] Age to nearest year

[2] It should not be overlooked that there is considerable variation among fields in "age at Ph.D.", see p. 143.

Table I-9

Marital Status of Doctorate Recipients at Time of Ph.D. 1/by Sex and Racial/Ethnic Group in Fiscal Years 1973-1976 (Percent Married)

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Marital Status	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Percent Married																
- 1973	81.8%	79.7%	81.7%	88.3%	86.2%	66.7%	83.0%	82.0%	56.7%	52.3%	66.7%	62.5%	71.4%	50.0%	53.7%	56.0%
- 1974	80.8	83.7	84.5	83.7	78.4	74.5	75.2	80.6	56.3	51.9	65.2	37.5	52.9	63.6	51.5	55.9
- 1975	78.3	80.2	82.9	82.3	85.1	68.1	71.2	78.2	54.1	56.7	63.3	58.6	28.6	47.2	55.4	54.3
- 1976	76.5	76.2	87.2	77.9	79.5	61.2	62.6	76.1	56.1	54.7	55.9	52.5	84.0	61.2	56.3	56.1
Total Responses																
- 1973	15,898	419	82	77	29	99	4,782	21,386	3,738	149	24	16	7	24	1,099	5,011
- 1974	17,774	545	97	123	37	106	874	19,556	4,515	258	23	24	17	33	206	5,076
- 1975	17,935	621	111	147	47	94	549	19,504	5,408	335	30	29	14	36	157	6,009
- 1976	17,655	626	109	163	39	98	537	19,227	5,674	424	34	40	25	49	135	6,381
Not Reported																
- 1973	120	8	2	1	-	-	230	361	19	1	-	-	-	-	46	66
- 1974	142	15	1	-	1	2	368	529	47	1	-	1	-	-	57	106
- 1975	95	9	1	-	1	-	278	384	38	4	1	-	-	-	49	92
- 1976	89	10	1	3	1	1	264	369	43	5	1	-	-	1	56	106

1/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

I-9 Marital Status of Doctorate Recipients at Time of Ph.D. by Sex and Racial/Ethnic Group in Fiscal Years 1973-1976

Racial/Ethnic Group Differences

Examination of total responses for all four years shows the American Indian and Puerto Rican groups to have the highest percentage of Ph.D.'s, 79.4% and 76.3%, respectively, who are married upon completion of the degree. Asians, who complete their Ph.D.'s at an early age, have the smallest proportion, 64.7%, of married doctorate recipients.

Sex Differences

A much higher proportion of male than of female Ph.D.'s was married at the time of the degree. In 1976, 76.1% of men and 56.1% of women Ph.D.'s were married. In the total figures for male Ph.D.'s there is a striking drop of nearly 6%, from 82.0% in 1973 to 76.1% in 1976, in the percentage of those married at the time of the degree while the proportion for females remained stable from 1973 to 1976.

The 56.1% of women married at the time of the degree in 1976 is higher than those found in two studies of women Ph.D.'s conducted several years after they received their degrees. In 1965 Astin (1969, p. 27) found that 54.7% of the 1957 and 1958 women Ph.D.'s were or had been married but only 44.6% were at the time of the study. In 1973, Centra found that 70% of the women who had received degrees in 1968 had been married but only 52.5% were in the year of the study (1974, pp. 101-103). These studies found a high incidence of divorce and separation among women Ph.D.'s, also reported for women graduate students (Carnegie, 1973b, p. 83; Feldman, 1974, p. 19), so that the percentage of women not married at the time of the degree may include a number of formerly married women in addition to those never married.

Sex Differences within Racial/Ethnic Groups

Inspection of the totals for 1973 to 1976 shows the largest difference among the Chicanos, the group with the lowest percent of married women, 52.3%, and one of the highest percents of married men, 82.2%. The smallest difference was found among the Asians, the group having the lowest proportion of married men but a percentage of married women close to that for all women.

Table I- 10
Percentage Distribution of Doctorate Recipients 1/ by Number of Dependents at Time of Ph.D., by Sex and Racial/Ethnic Group, 1975-1976 2/
(Percent of Total Reported)

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Number of Dependents	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
0	27.4%	18.5%	17.4%	17.9%	20.0%	36.9%	37.7%	27.3%	72.3%	48.5%	58.3%	41.3%	33.3%	79.7%	62.5%	70.3%
1-2	41.2	40.0	43.5	39.3	28.6	45.0	38.8	41.0	22.7	42.3	20.8	43.5	30.3	18.8	32.0	24.2
3 or more	31.5	41.5	39.1	42.9	51.4	18.1	23.5	31.7	5.0	9.3	20.8	15.2	36.4	1.6	5.5	5.5
Total Reported	29,463	1,005	161	252	70	149	758	31,858	8,574	613	48	46	33	64	128	9,506
Unknown	6,311	261	61	61	18	44	870	7,626	2,589	155	18	23	6	22	269	3,082
	100.1%	100.0%	100.0%	100.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.1%	99.9%	100.0%	100.0%	100.1%	100.0%	100.0%

1/ Native-born U.S. citizens only

2/ 1975 was the first year data on number of dependents were collected.

Source: Survey of Earned Doctorates, National Research Council

I-10 Percentage Distribution of Doctorate Recipients by Number of Dependents[1/] at Time of Ph.D., by Sex and Racial/Ethnic Group, 1975-1976

Racial/Ethnic Group Differences

A higher proportion of Asians than of any other group is without dependents at the time the degree is received. A higher proportion of this group than of others is young (Table I-8) and is unmarried (Table I-9). Whites are next of those without dependents when they complete the Ph.D. The Puerto Rican group has the highest proportion with three dependents or more when they complete the doctorate.

Sex Differences

A much smaller proportion of women than of men has dependents at the time they receive the degree. This is expected since fewer women than men are married (Table I-9). Nevertheless, nearly 30% of the women report having at least one dependent.

Sex Differences within Racial/Ethnic Groups

Of those with no dependents at the time they receive the Ph.D., the largest difference between the sexes appears among Whites, Asians and American Indians. In these groups a much smaller proportion of women than men has dependents when the doctorate is obtained. The smallest difference appears in the Puerto Rican group in which only a third of the women have no dependents. Less than half the Black and Chicano women are also without dependents upon completion of the degree, but the proportions of women are still considerably larger than the proportions of men with no dependents in these groups.

At the high end of the distribution, the largest difference appears in the Black group where 41.5% of the men, but only 9.3% of the women, have at least three dependents when they receive the doctorate. The smallest differences between the sexes are to be found for Puerto Ricans and Asians but the two groups display different patterns. The percentages of Puerto Ricans, both men and women, having three dependents or more is higher than for other groups, with Asians having the lowest proportions.

[1/] Dependent = someone receiving at least one-half of his or her support from the doctorate recipient.

Table I-11
Percentage of Doctorate Recipients 1/ in FY 1973-1976 by Broad Field, Racial/Ethnic Group and Sex

		MEN								WOMEN							
		Racial/Ethnic Group								Racial/Ethnic Group							
BROAD FIELD OF PH.D.		White	Black	Amer. Indian	Chi-cano	Puerto Rican	Asian	Other & Unk	Total	White	Black	Amer. Indian	Chi-cano	Puerto Rican	Asian	Other & Unk	Total
MATHEMATICS	N	2562	31	14	14	5	20	300	2946	299	5		1		4	19	328
	H	87.0	1.1	.5	.5	.2	.7	10.2		91.2	1.5		.3		1.2	5.8	
	V 2/	3.7	1.4	3.5	2.7	3.2	5.0	3.8	3.6	1.5	.4		.9		2.8	1.1	1.4
PHYSICS & ASTRON	N	3166	20	11	11	4	18	400	3630	113	3	1			2	11	130
	H	87.2	.6	.3	.3	.1	.5	11.0		86.9	2.3	.8			1.5	8.5	
	V	4.5	.9	2.7	2.1	2.6	4.5	5.1	4.5	.6	.3	.9			1.4	.6	.6
CHEMISTRY	N	4227	75	10	21	4	32	432	4801	426	6	2		1	8	29	472
	H	88.0	1.6	.2	.4	.1	.7	9.0		90.3	1.3	.4		.2	1.7	6.1	
	V	6.1	3.3	2.5	4.1	2.6	8.0	5.5	5.9	2.2	.5	1.8		1.6	5.6	1.6	2.1
EARTH SCIENCES	N	1679	4	10	4	6	11	183	1897	121	3	1				12	137
	H	88.5	.2	.5	.2	.3	.6	9.6		88.3	2.2	.7				8.8	
	V	2.4	.2	2.5	.8	3.9	2.8	2.3	2.3	.6	.3	.9				.7	.6
ENGINEERING	N	5663	52	23	16	17	46	615	6432	86						2	88
	H	88.0	.8	.4	.2	.3	.7	9.6		97.7						2.3	
	V	8.1	2.3	5.7	3.1	11.0	11.5	7.8	7.9	.4						.1	.4
BIOSCIENCES	N	10217	153	54	63	20	116	1113	11736	2470	71	12	7	4	29	211	2804
	H	87.1	1.3	.5	.5	.2	1.0	9.5		88.1	2.5	.4	.2	.1	1.0	7.5	
	V	14.7	6.8	13.4	12.3	12.9	29.0	14.1	14.4	12.7	6.0	10.6	6.4	6.3	20.3	12.0	12.3
PSYCHOLOGY	N	5795	146	36	39	21	28	586	6651	2594	86	11	6	7	19	225	2948
	H	87.1	2.2	.5	.6	.3	.4	8.8		88.0	2.9	.4	.2	.2	.6	7.6	
	V	8.3	6.5	8.9	7.6	13.5	7.0	7.4	8.2	13.3	7.3	9.7	5.5	11.1	13.3	12.8	12.9
SOCIAL SCIENCES	N	7425	187	37	53	12	37	913	8664	1978	68	11	8	9	6	154	2234
	H	85.7	2.2	.4	.6	.1	.4	10.5		88.5	3.0	.5	.4	.4	.3	6.9	
	V	10.7	8.3	9.2	10.3	7.7	9.3	11.6	10.7	10.2	5.8	9.7	7.3	14.3	4.2	8.8	9.8
ARTS & HUMANITIES	N	10141	191	62	77	23	27	1239	11760	4543	107	28	33	10	31	446	5198
	H	86.2	1.6	.5	.7	.2	.2	10.5		87.4	2.1	.5	.6	.2	.6	8.6	
	V	14.5	8.5	15.3	15.0	14.8	6.8	15.7	14.5	23.3	9.1	24.8	30.0	15.9	21.7	25.4	22.8
PROFESSIONAL FIELDS	N	3332	78	13	14	8	10	354	3809	633	53	5	6	2	5	62	766
	H	87.5	2.0	.3	.4	.2	.3	9.3		82.6	6.9	.7	.8	.3	.7	8.1	
	V	4.8	3.5	3.2	2.7	5.2	2.5	4.5	4.7	3.2	4.5	4.4	5.5	3.2	3.5	3.5	3.4
EDUCATION	N	15438	1315	134	201	35	54	1733	18910	6196	775	42	49	30	39	588	7719
	H	81.6	7.0	.7	1.1	.2	.3	9.2		80.3	10.0	.5	.6	.4	.5	7.6	
	V	22.1	58.4	33.2	39.1	22.6	13.5	22.0	23.3	31.8	65.8	37.2	44.5	47.6	27.3	33.4	33.8
OTHER	N	55	1		1		1	8	66	20							20
	H	83.3	1.5		1.5		1.5	12.1		100.0							
	V	.1			.2		.3	.1	.1	.1							.1
UNKN	N	8						6	14	3							3
	H	57.1						42.9		100.0							
TOTAL RESPONSE	N	69700	2253	404	514	155	400	7876	81302	19479	1177	113	110	63	143	1759	22844
	H	85.7	2.8	.5	.6	.2	.5	9.7		85.3	5.2	.5	.5	.3	.6	7.7	
TOTAL ALL	N	69708	2253	404	514	155	400	7882	81316	19482	1177	113	110	63	143	1759	22847
	H	85.7	2.8	.5	.6	.2	.5	9.7		85.3	5.2	.5	.5	.3	.6	7.7	

1/ Native-born U.S. citizens only

2/ V provides vertical percentages within columns based on total response. V not shown for unknown because of very small numbers of respondents.

Source: Survey of Earned Doctorates, National Research Council

I-11 Percentage of Doctorate Recipients in FY 1973-1976 by Broad Field,[1] Racial/Ethnic Group and Sex

Racial/Ethnic Group Differences

A comparison of the field distributions of different groups shows the Asians to have larger proportions than any other group in the biological sciences, the physical sciences combined and engineering, and smaller proportions than others in education and the professional fields. Blacks display much greater concentration than any other group in education, 60.9%, and smaller percentages than other groups in the physical sciences (except chemistry), mathematics, engineering, the biological sciences and the arts and humanities.

Sex Differences

Substantially larger proportions of women than men obtain degrees in the arts and humanities and in education. The fields in which men receive much higher proportions of doctorates than women are the physical sciences and engineering. Men obtain 24.2% of their degrees in these areas while the figure for women is 5.1%. Although the number of women Ph.D.'s in the physical sciences and engineering increased during the four years covered by this study, this number as a percentage of all women Ph.D.'s decreased.[2]

Sex Differences within Racial/Ethnic Groups

Among Asians, in every field except the professional fields, there are large differences between the sexes. These follow the patterns described for all men and women but Asian men have a smaller proportion than all other men in education and in the arts and humanities, and higher proportions than others in the physical sciences, engineering and the biological sciences. Among Blacks, men have smaller proportions of doctorates than other men in the physical sciences, engineering and the biological sciences while smaller proportions of Black women than other women are in the arts and humanities so that sex differences are minimal in this group. The largest difference is in education but the percentage of men is increasing while that of women is decreasing.[2]

---

[1] See Appendix C, p. 180 for description of fields.

[2] Inspection of the data (available in CHR) for each year revealed few clear trends. Therefore, data were presented for all four years combined and change reported, where relevant.

I-12 Baccalaureate Field of Ph.D. Recipients[1/] by Ph.D. Field, Sex and Racial/Ethnic Group

Tables I-12a and b on pages 44-47 show that with the exception of those in the professional fields and education, the majority of doctorate recipients in each field earlier obtained baccalaureates in the same field. This holds true for the various racial/ethnic groups and for both sexes so that the differences described below represent minor variations of the general pattern.

When doctorate recipients of different fields are compared (on baccalaureate origins), the numbers for some groups, particularly women, are very small. Therefore, cells that represent fewer than 5 individuals are disregarded in the following discussion to avoid the large variation in percentages that can occur in small cells.

Racial/Ethnic Group Differences

A greater proportion of Blacks than others with education and physical science doctorates also received their baccalaureates in the same fields. A smaller proportion of Blacks than others with degrees in the professional fields also received B.A.'s in these fields.

Puerto Ricans with education doctorates have the smallest proportion who did undergraduate work in that field. They also have the highest proportion of engineering Ph.D.'s [2/] with baccalaureates in the same field.

American Indian doctorate recipients in the biological sciences show the smallest proportions with B.A.'s in the same area.

Sex Differences

The one Ph.D. field showing substantial differences between the sexes is engineering. In this area, much higher proportions of men than women[3/] started out in that specialty. A smaller difference is found in education, in which somewhat higher proportions of female than male doctorate recipients did under-

---

1/ Native-born U.S. citizens only
2/ Applies only to men
3/ All women Ph.D.'s in engineering are White

graduate work in that field.

For both sexes, far more than half of the Ph.D.'s in the physical sciences, biological sciences and the arts and humanities have done undergraduate work in those fields. Most of those with social science doctorates also received the baccalaureate in the same field but the percentages are a little lower. Much smaller percentages of those with graduate degrees in the professional fields and education have also come out of those B.A. fields.

Sex Differences within Racial/Ethnic Groups

Among Asians, a larger proportion of male than female doctorate recipients in the arts and humanities began their studies in those fields. In the social sciences, larger proportions of White, American Indian and Asian men than women Ph.D.'s received baccalaureates in those areas. Among Puerto Ricans, Chicanos and Blacks, smaller percentages of male than female social science doctorate recipients started work in those fields. American Indian male Ph.D.'s in the physical, social and biological sciences show larger proportions than female Ph.D.'s with baccalaureates in the same fields.

Table I-12a
Baccalaureate Field of Ph.D. Recipients 1/ by Ph.D. Field, Sex and Racial/Ethnic Group, 1973-1976

MEN

Ph.D. Field

	Physical 2/ Sciences	Engineering	Biological Sciences	Social 2/ Sciences	Arts & Human.	Prof. Fields	Education	Other
Total Reporting 3/								
White	11,515	5,606	10,016	13,070	10,012	3,286	15,244	54
Black	130	52	148	326	186	77	1,278	1
Amer. Indian	44	23	51	72	60	13	130	-
Chicano	49	16	61	90	74	14	197	-
Puerto Rican	17	17	20	33	23	8	31	-
Asian	79	46	115	64	27	10	53	1
Baccalaureate Field								
Physical Science 2/								
White	89.0%	12.6%	15.9%	4.7%	2.2%	6.0%	6.7%	22.2%
Black	93.8	19.2	13.5	3.7	3.8	11.7	7.7	-
Amer. Indian	93.2	13.0	13.7	5.6	1.7	-	6.9	-
Chicano	87.8	12.5	14.8	2.2	-	-	4.1	-
Puerto Rican	70.6	5.9	10.0	3.0	-	-	-	-
Asian	84.8	8.7	15.7	3.1	3.7	-	-	-
Engineering								
White	5.7	84.9	1.5	2.0	.7	11.3	1.5	13.0
Black	.8	76.9	-	2.5	-	9.1	.3	-
Amer. Indian	4.5	87.0	-	5.6	3.3	7.7	.8	-
Chicano	4.1	87.5	1.6	1.1	-	14.3	.5	-
Puerto Rican	11.8	94.1	-	3.0	-	-	-	-
Asian	7.6	91.3	1.7	1.6	7.4	20.0	-	-
Biological Science								
White	2.5	.8	75.1	2.3	.6	2.2	5.3	3.7
Black	4.6	-	79.7	4.0	.5	1.3	9.6	100.0
Amer. Indian	-	-	72.5	1.4	-	7.7	4.6	-
Chicano	8.2	-	80.3	-	-	-	6.1	-
Puerto Rican	17.6	-	90.0	6.1	-	-	3.2	-
Asian	6.3	-	78.3	7.8	-	-	9.4	100.0

1/ Native-born U.S. citizens only
2/ Physical Sciences includes Mathematics and Environmental Sciences; Social Sciences includes Psychology.
3/ Total Reporting does not include those who did not report race or baccalaureate field.

Source: Survey of Earned Doctorates, National Research Council

Table I-12a continued

Baccalaureate Field of Ph.D. Recipients [1] by Ph.D. Field, Sex and Racial/Ethnic Group, 1973-1976

MEN

Ph.D. Field

	Physical [2] Sciences	Engineering	Biological Sciences	Social [2] Sciences	Arts & Human.	Prof. Fields	Education	Other
Social Sciences [2]								
White	.4%	.5%	2.7%	70.8%	5.4%	16.0%	17.5%	16.7%
Black	-	1.9	1.4	67.2	7.5	32.5	16.4	-
Amer. Indian	-	-	2.0	68.1	-	7.7	20.0	-
Chicano	-	-	1.6	67.8	8.1	28.6	20.8	-
Puerto Rican	-	-	-	63.6	4.3	25.0	29.0	-
Asian	-	-	3.5	75.0	14.8	30.0	22.6	-
Arts & Humanities								
White	.8	.4	1.4	12.7	84.3	19.9	19.5	20.4
Black	.8	-	-	7.4	76.3	19.5	14.2	-
Amer. Indian	-	-	-	15.3	90.0	15.4	16.2	-
Chicano	-	-	-	13.3	89.2	21.4	19.3	-
Puerto Rican	-	-	-	9.1	87.0	62.5	22.6	-
Asian	1.3	-	.9	6.3	70.4	20.0	18.9	-
Professional Fields								
White	.2	.3	.5	4.4	1.8	39.9	6.1	13.0
Black	-	-	.7	2.8	2.7	18.2	3.5	-
Amer. Indian	-	-	-	4.2	-	61.5	5.4	-
Chicano	-	-	-	6.7	1.4	28.6	4.6	-
Puerto Rican	-	-	-	9.1	-	12.5	6.5	-
Asian	-	-	-	4.7	-	30.0	7.5	-
Education								
White	1.1	.2	2.6	2.8	4.8	4.0	43.1	3.7
Black	-	1.9	4.7	12.6	9.1	6.5	48.0	-
Amer. Indian	2.3	-	11.8	-	5.0	-	46.2	-
Chicano	-	-	1.6	7.8	1.4	7.1	43.7	-
Puerto Rican	-	-	-	6.1	8.7	-	32.3	-
Asian	-	-	-	1.6	3.7	-	41.5	-
Other								
White	.3	.3	.3	.3	.1	.8	.5	7.4
Black	-	-	-	-	-	1.3	.2	-
Amer. Indian	-	-	-	-	-	-	-	-
Chicano	-	-	-	1.1	-	-	1.0	-
Puerto Rican	-	-	-	-	-	-	6.5	-
Asian	-	-	-	-	-	-	-	-

Table I-12b
Baccalaureate Field of Ph.D. Recipients 1/ by Ph.D. Field, Sex and Racial/Ethnic Group, 1973-1976

WOMEN

Ph.D. Field

	Physical 2/ Sciences	Engineering	Biological Sciences	Social 2/ Sciences	Arts & Human.	Prof. Fields	Education	Other
Total Reporting 3/								
White	948	85	2,431	4,502	4,466	620	6,099	18
Black	17	-	70	152	106	51	758	-
Amer. Indian	4	-	12	21	28	5	41	-
Chicano	1	-	7	13	33	6	49	-
Puerto Rican	1	-	4	15	10	2	30	-
Asian	13	-	29	24	28	5	38	-
Baccalaureate Field								
Physical Sciences 2/								
White	89.7%	38.8%	15.8%	3.0%	1.7%	4.0%	4.8%	22.2%
Black	88.2	-	14.3	2.0	-	2.0	5.7	-
Amer. Indian	75.0	-	25.0	4.8	-	-	2.4	-
Chicano	100.0	-	-	-	-	16.7	6.1	-
Puerto Rican	100.0	-	50.0	-	10.0	-	-	-
Asian	100.0	-	17.2	8.3	-	-	5.3	-
Engineering								
White	.7	51.8	-	-	-	-	.1	-
Black	5.9	-	-	-	-	-	-	-
Amer. Indian	-	-	-	-	-	-	-	-
Chicano	-	-	-	-	-	-	-	-
Puerto Rican	-	-	-	-	-	-	-	-
Asian	-	-	-	-	-	-	-	-
Biological Sciences								
White	4.3	2.4	73.3	4.3	.8	3.9	7.5	5.6
Black	5.9	-	80.0	3.3	3.8	3.9	6.1	-
Amer. Indian	-	-	50.0	4.8	-	-	7.3	-
Chicano	-	-	85.7	-	-	-	6.1	-
Puerto Rican	-	-	50.0	-	10.0	-	13.3	-
Asian	-	-	79.3	4.2	-	-	2.6	-

1/ Native-born U.S. citizens only
2/ Physical Sciences includes Mathematics and Environmental Sciences; Social Sciences includes Psychology.
3/ Total Reporting does not include those who did not report race or baccalaureate field.

Source: Survey of Earned Doctorates, National Research Council

Table I-12b continued
Baccalaureate Field of Ph.D. Recipients 1/ by Ph.D. Field, Sex and Racial/Ethnic Group, 1973-1976

WOMEN

Ph.D. Field

	Physical 2/ Sciences	Engineering	Biological Sciences	Social 2/ Sciences	Arts & Human.	Prof. Fields	Education	Other
Social Sciences 2/								
White	.8%	2.4%	2.9%	68.9%	3.9%	15.6%	14.1%	27.8%
Black	-	-	1.4	67.8	3.8	31.4	10.2	-
Amer. Indian	-	-	-	47.6	-	-	7.3	-
Chicano	-	-	-	76.9	3.0	50.0	10.2	-
Puerto Rican	-	-	-	73.3	-	-	16.7	-
Asian	-	-	3.4	58.3	7.1	-	18.4	-
Arts & Humanities								
White	1.9	1.2	2.5	14.4	87.6	23.4	21.4	27.8
Black	-	-	1.4	9.9	77.4	15.7	15.3	-
Amer. Indian	25.0	-	8.3	23.8	92.9	40.0	19.5	-
Chicano	-	-	-	7.7	93.9	-	20.4	-
Puerto Rican	-	-	-	-	80.0	50.0	33.3	-
Asian	-	-	-	8.3	89.3	-	28.9	-
Professional Fields								
White	.2	2.4	1.8	2.6	1.1	37.1	5.2	-
Black	-	-	-	5.3	1.9	27.5	3.6	-
Amer. Indian	-	-	8.3	4.8	7.1	40.0	4.9	-
Chicano	-	-	-	-	3.0	-	4.1	-
Puerto Rican	-	-	-	20.0	-	-	3.3	-
Asian	-	-	-	4.2	3.6	60.0	-	-
Education								
White	2.3	1.2	3.5	6.5	4.8	15.8	46.8	11.1
Black	-	-	2.9	11.8	13.2	19.6	59.2	-
Amer. Indian	-	-	8.3	14.3	-	20.0	58.5	-
Chicano	-	-	14.3	15.4	-	33.3	53.1	-
Puerto Rican	-	-	-	6.7	-	50.0	33.3	-
Asian	-	-	-	16.7	-	40.0	44.7	-
Other								
White	-	-	.2	.2	.1	.2	.2	5.6
Black	-	-	-	-	-	-	-	-
Amer. Indian	-	-	-	-	-	-	-	-
Chicano	-	-	-	-	-	-	-	-
Puerto Rican	-	-	-	-	-	-	-	-
Asian	-	-	-	-	-	-	-	-

Table I-13
Education of Fathers of Doctorate Recipients [1/] by Ph.D. Field, Sex and Racial/Ethnic Group, 1973-1976

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Ph.D. Field & Father's Edu.	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Physical Sci.																
0-11 yrs.	2,366 20.3%	57 43.8%	12 26.7%	21 42.0%	7 36.8%	22 27.2%	219 16.7%	2,704 20.4%	155 16.2%	3 17.6%	1 25.0%	-	-	4 28.6%	9 12.7%	172 16.1%
HS or some college	4,582 39.4	25 19.2	22 48.9	16 32.0	5 26.3	24 29.6	387 29.4	5,061 38.1	333 34.7	11 64.7	1 25.0	-	1	3 21.4	19 26.8	368 34.5
College or more	4,023 34.6	30 23.1	10 22.2	10 20.0	5 26.3	26 32.1	402 30.6	4,506 34.0	410 42.8	1 5.9	2 50.0	1	-	7 50.0	28 39.4	449 42.1
Unknown	663 5.7	18 13.8	1 2.2	3 6.0	2 10.5	9 11.1	307 23.3	1,003 7.6	61 6.4	2 11.8	-	-	-	-	15 21.1	78 7.3
Total	11,634 100.0	130 99.9	45 100.0	50 100.0	19 99.9	81 100.0	1,315 100.0	13,274 100.1	959 100.1	17 100.0	4 100.0	1	1	14 100.0	71 100.0	1,067 100.0
Engineering																
0-11 yrs.	1,314 23.2	18 34.6	6 26.1	8 50.0	5 29.4	13 28.3	119 19.3	1,483 23.1	8 9.3	-	-	-	-	-	-	8 9.1
HS or some college	2,308 40.8	18 34.6	10 43.5	4 25.0	9 52.9	13 28.3	201 32.7	2,563 39.8	35 40.7	-	-	-	-	-	-	35 39.8
College or more	1,775 31.3	12 23.1	7 30.4	3 18.8	2 11.8	15 32.6	171 27.8	1,985 30.9	41 47.7	-	-	-	-	-	1	42 47.7
Unknown	266 4.7	4 7.7	-	1 6.3	1 5.9	5 10.9	124 20.2	401 6.2	2 2.3	-	-	-	-	-	1	3 3.4
Total	5,663 100.0	52 100.0	23 100.0	16 100.1	17 100.0	46 100.1	615 100.0	6,432 100.0	86 100.0	-	-	-	-	-	2	88 100.0
Biosciences																
0-11 yrs.	2,358 23.1	79 51.6	14 25.9	30 47.6	7 35.0	28 24.1	259 23.3	2,775 23.6	413 16.7	23 32.4	2 16.6	3 43.0	-	6 20.7	42 19.9	489 17.4
HS or some college	4,154 40.7	38 24.8	19 35.2	18 28.6	7 35.0	47 40.5	346 31.1	4,629 39.4	872 35.3	29 40.8	4 33.3	3 43.0	2 50.0	5 17.2	54 25.6	969 34.6
College or more	3,126 30.6	18 11.8	16 29.6	9 14.3	6 30.0	34 29.3	290 26.1	3,499 29.8	1,054 42.7	16 22.5	3 25.0	1 14.0	2 50.0	15 51.7	64 30.3	1,155 41.2
Unknown	579 5.7	18 11.8	5 9.3	6 9.5	-	7 6.0	218 19.6	833 7.1	131 5.3	3 4.2	3 25.0	-	-	3 10.3	51 24.2	191 6.8
Total	10,217 100.1	153 100.0	54 100.0	63 100.0	20 100.0	116 99.9	1,113 100.1	11,736 99.9	2,470 100.0	71 99.9	12 99.9	7 100.0	4 100.0	29 99.9	211 100.0	2,804 100.0

[1/] Native-born U.S. only

Source: Survey of Earned Doctorates, National Research Council

I-13 Education of Fathers of Doctorate Recipients by Ph.D. Field, Sex and Racial/Ethnic Group, 1973-1976

This table explores the relationship between one background factor, education of father, and the field of the doctorate recipient. As in the preceding table, cells representing less than 5 individuals have been left out of this discussion.

Racial/Ethnic Group Differences

The fathers of Black and Chicano Ph.D.'s in the physical sciences, engineering 1/, the biological sciences, social sciences and arts and humanities show lower levels of educational attainment than the fathers of members of other groups. The fathers of White and Asian Ph.D.'s in the physical sciences show relatively high educational achievement.

Sex Differences

The general pattern when field is held constant is for the fathers of female Ph.D.'s to show a higher level of educational attainment than the fathers of male Ph.D.'s. This picture is sharply accentuated in the field of engineering 2/ where 23.1% of the fathers of male Ph.D.'s and only 9.1% of the fathers of female Ph.D.'s have not completed high school. In this field, 30.9% of the fathers of male doctoral engineers have at least four years of college compared with 47.7% of the fathers of females. The differences are somewhat smaller in the physical sciences and education than in other fields and virtually disappear in the professional fields.

Sex Differences within Racial/Ethnic Groups by Field

For Asians, the fathers of women Ph.D.'s in the biological sciences, arts and humanities and education show much higher educational achievement than the fathers of men Ph.D.'s. A similar picture is evident for Blacks in the biological, social sciences and professional fields and for Chicanos in the arts and humanities. In the last field, there is an interesting reversal of the usual pattern: the fathers of American Indian women show a much lower level of educational achievement than the fathers of the men.

1/ Refers to men, except for Whites, the only group with women engineers.
2/ Refers to White women since there are no minority women engineers.

Table I-13 continued

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Ph.D. Field & Father's Edu.	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Social Sciences																
0-11 yrs.	3,012 22.8%	150 45.0%	24 32.9%	49 53.3%	12 36.4%	16 24.6%	262 17.5%	3,525 23.0%	814 17.8%	41 26.6%	6 27.3%	4 28.6%	5 31.3%	7 28.0%	48 12.7%	925 17.9%
HS or some college	5,188 39.2	91 27.3	26 35.6	26 28.3	11 33.3	28 43.1	449 30.0	5,819 38.0	1,492 32.6	56 36.4	8 36.4	8 57.1	4 25.0	8 32.0	104 27.4	1,680 32.4
College or more	4,331 32.8	52 15.6	19 26.0	13 14.1	8 24.2	15 23.1	387 25.8	4,825 31.5	1,992 43.6	43 27.9	5 22.7	2 14.3	6 37.5	9 36.0	118 31.1	2,175 42.0
Unknown	689 5.2	40 12.0	4 5.5	4 4.3	2 6.1	6 9.2	401 26.8	1,146 7.5	274 6.0	14 9.1	3 13.6	-	1 6.3	1 4.0	109 28.8	402 7.8
Total	13,220 100.0	333 99.9	73 100.0	92 100.0	33 100.0	65 100.0	1,499 100.1	15,315 100.0	4,572 100.0	154 100.0	22 100.0	14 100.0	16 100.1	25 100.0	379 100.0	5,182 100.1
Arts & Humanities																
0-11 yrs.	2,350 23.2	84 44.0	12 19.4	44 57.1	8 34.8	10 37.0	230 18.6	2,738 23.3	715 15.7	36 33.6	15 53.6	10 30.3	-	4 12.9	60 13.5	840 16.2
HS or some college	3,696 36.4	53 27.7	25 40.3	15 19.5	10 43.5	9 33.3	332 26.8	4,140 35.2	1,493 32.9	35 32.7	7 25.0	10 30.3	3 30.0	11 35.5	86 19.3	1,645 31.6
College or more	3,502 34.5	30 15.7	20 32.3	9 11.7	3 13.0	5 18.5	308 24.9	3,877 33.0	2,047 45.1	25 23.4	5 17.9	12 36.4	5 50.0	14 45.2	141 31.6	2,249 43.3
Unknown	593 5.8	24 12.6	5 8.1	9 11.7	2 8.7	3 11.1	369 29.8	1,005 8.5	288 6.3	11 10.3	1 3.6	1 3.0	2 20.0	2 6.5	159 35.7	464 8.9
Total	10,141 99.9	191 100.0	62 100.1	77 100.0	23 100.0	27 99.9	1,239 100.1	11,760 100.0	4,543 100.0	107 100.0	28 100.1	33 100.0	10 100.0	31 100.1	446 100.1	5,198 100.0
Professional Fields																
0-11 yrs.	994 29.8	35 44.9	5 38.5	7 50.0	5 62.5	2 20.0	95 26.8	1,143 30.0	178 28.1	16 30.2	2 40.0	5 83.3	1 50.0	3 60.0	14 22.6	219 28.6
HS or some college	1,344 40.3	25 32.1	6 46.2	2 14.3	2 25.0	4 40.0	118 33.3	1,501 39.4	218 34.4	13 24.5	2 40.0	1 16.7	-	2 40.0	19 30.6	255 33.3
College or more	809 24.3	15 19.2	2 15.4	2 14.3	-	4 40.0	81 22.9	913 24.0	205 32.4	17 32.1	-	-	1 50.0	-	17 27.4	240 31.3
Unknown	185 5.6	3 3.8	-	3 21.4	1 12.5	-	60 16.9	252 6.6	32 5.1	7 13.2	1 20.0	-	-	-	12 19.4	52 6.8
Total	3,332 100.0	78 100.0	13 100.1	14 100.0	8 100.0	10 100.0	354 99.9	3,809 100.0	633 100.0	53 100.0	5 100.0	6 100.0	2 100.0	5 100.0	62 100.0	766 100.0

Table I-13 continued

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Ph.D. Field & Father's Edu.	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Education																
0-11 yrs.	6,424 41.6%	710 54.0%	70 52.2%	140 69.7%	19 54.3%	22 40.7%	641 37.0%	8,026 42.4%	1,961 31.6%	357 46.1%	14 33.3%	30 61.2%	11 36.7%	12 30.8%	174 29.6%	2,559 33.2%
HS or some college	5,475 35.5	337 25.6	40 29.9	37 18.4	8 22.9	17 31.5	510 29.4	6,424 34.0	2,245 36.2	203 26.2	15 35.7	12 24.5	10 33.3	10 25.6	158 26.9	2,653 34.4
College or more	2,693 17.4	105 8.0	16 11.9	10 5.0	1 2.9	6 11.1	256 14.8	3,087 16.3	1,621 26.2	134 17.3	9 21.4	4 8.2	6 20.0	14 35.9	132 22.4	1,920 24.9
Unknown	846 5.5	163 12.4	8 6.0	14 7.0	7 20.0	9 16.7	326 18.8	1,373 7.3	369 6.0	81 10.5	4 9.5	3 6.1	3 10.0	3 7.7	124 21.1	587 7.6
Total	15,438 100.0	1,315 100.0	134 100.0	201 100.1	35 100.1	54 100.0	1,733 100.0	18,910 100.0	6,196 100.0	775 100.1	42 99.9	49 100.0	30 100.0	39 100.0	588 100.0	7,719 100.1
Total 2/																
0-11 yrs.	18,825 27.0	1,133 50.3	143 35.4	300 58.4	63 40.6	113 28.3	1,830 23.2	22,407 27.6	4,246 21.8	476 40.4	40 35.4	52 47.3	17 27.0	36 25.2	347 19.7	5,214 22.8
HS or some college	26,770 38.4	588 26.1	148 36.6	118 23.0	52 33.5	142 35.5	2,344 29.8	30,162 37.1	6,694 34.4	347 29.5	37 32.7	34 30.9	20 31.7	39 27.3	440 25.0	7,611 33.3
College or more	20,278 29.1	262 11.6	90 22.3	56 10.9	25 16.1	106 26.5	1,897 24.1	22,714 27.9	7,382 37.9	236 20.1	24 21.2	20 18.2	20 31.7	59 41.3	501 28.5	8,242 36.1
Unknown	3,827 5.5	270 12.0	23 5.7	40 7.8	15 9.7	39 9.8	1,805 22.9	6,019 7.4	1,157 5.9	118 10.0	12 10.6	4 3.6	6 9.5	9 6.3	471 26.8	1,777 7.8
Total	69,700 100.0	2,253 100.0	404 100.0	514 100.1	155 99.9	400 100.1	7,876 100.0	81,302 100.0	19,479 100.0	1,177 100.0	113 99.9	110 100.0	63 99.9	143 100.1	1,759 100.0	22,844 100.0

2/ Includes 103 cases where field of Ph.D. was other or unknown

Table I-14
Percentage Distribution of Doctorate Recipients 1/ in 1973 and 1976, by Elapsed Time from B.A. to Entrance to Graduate School, by Sex and Racial/Ethnic Group as Percentage of Total Responding

Elapsed Time in Years Between B.A. and Entrance into Graduate School		MEN								WOMEN							
		Racial/Ethnic Group								Racial/Ethnic Group							
		White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
0	1973	70.0%	46.4%	66.3%	62.8%	55.2%	72.6%	68.9%	69.2%	57.5%	34.0%	45.8%	50.0%	28.6%	56.5%	57.3%	56.7%
	1976	67.5	41.1	59.8	63.8	60.5	68.4	71.1	66.7	57.2	42.5	45.5	48.7	54.2	68.8	62.0	56.3
1-2	1973	17.0	20.4	13.3	19.2	24.1	16.8	17.9	17.3	20.7	31.9	20.8	21.4	42.9	21.7	20.7	21.0
	1976	18.9	25.2	23.4	21.9	21.1	17.9	17.9	19.1	22.6	25.7	18.2	23.1	20.8	10.4	17.8	22.6
3-8	1973	11.1	26.0	19.3	16.7	13.8	10.5	11.5	11.5	14.2	22.0	20.8	14.3	28.6	13.0	15.2	14.7
	1976	12.0	29.5	13.1	13.1	18.4	12.6	9.3	12.5	13.9	23.6	18.2	15.4	12.5	20.8	14.0	14.6
9 or more	1973	1.9	7.2	1.2	1.3	6.9	-	1.8	2.0	7.6	12.1	12.5	14.3	-	8.7	6.8	7.6
	1976	1.6	4.2	3.7	1.3	-	1.1	1.7	1.7	6.3	8.2	18.2	12.8	12.5	-	6.2	6.5
Total Number Responding	1973	15,676	416	83	78	29	95	4,775	21,152	3,665	141	24	14	7	23	1,027	4,901
	1976	17,334	616	107	160	38	95	592	18,942	5,575	416	33	39	24	48	129	6,264
Unknown	1973	342	11	1	-	-	4	237	595	92	9	-	2	-	1	72	176
	1976	410	20	3	6	2	4	209	654	142	13	2	1	1	2	62	223

1/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

I-14 Percentage Distribution of Doctorate Recipients in 1973 and 1976 by Elapsed Time[1] from B.A. to Entrance to Graduate School, by Sex and Racial/Ethnic Group as Percentage of Total Responding

Racial/Ethnic Group Differences

The White and Asian groups of doctorate recipients have the highest proportion who began graduate study immediately after receiving the baccalaureate degree. At the other extreme, in the Black group, less than half entered graduate school upon completion of the B.A. and a substantial number started only after a delay of nine years or more.

Sex Differences

A smaller proportion of female than male Ph.D.'s entered graduate school immediately after completion of the baccalaureate and the figure for females did not change from 1973 to 1976. While most men began graduate study immediately, the percentage of men who did so dropped slightly from the 1973 to the 1976 cohort. At the other extreme, a much higher proportion of women than men began advanced study after a period of nine years or more following the receipt of the baccalaureate.

Sex Differences within Racial/Ethnic Groups

In 1976, there was virtually no difference between Black men and women among those who had started graduate work immediately and those who had begun after a delay of one or two years. At the other extreme, of those who delayed graduate school nine or more years, Blacks of both sexes showed smaller proportions in 1976 than in 1973.

Examination of data available in the CHR giving totals for the four years shows the difference in elapsed time for the sexes to be greatest for the Puerto Ricans. In this group, 62.9% of the men but only 41.0% of the women began graduate work with no interruption after the baccalaureate. The difference between sexes in elapsed time is smallest among Blacks: 41.8% of the men and 37.6% of the women began graduate study with no delay, while 10.1% of the women and 5.3% of the men waited for nine years or more.

---

[1] It should not be overlooked that "elapsed time" shows considerable variability among fields, see p. 143.

Table I-15
Percentage Distribution of Doctorate Recipients 1/ in 1973 and 1976 by Years Out of School Between Entrance to Graduate School and Ph.D. by Sex and Racial/Ethnic Group as Percentage of Total Responding

Years Between Graduate School Entrance and Ph.D.		Men								Women							
		Racial/Ethnic Group								Racial/Ethnic Group							
		White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
0	-1973	46.5%	25.6%	43.8%	30.8%	39.3%	59.6%	44.7%	45.7%	42.1%	16.9%	36.4%	16.7%	42.9%	47.8%	35.4%	39.9%
	-1976	46.8	23.0	48.0	40.6	27.0	62.1	54.9	46.3	41.4	21.8	37.9	34.2	12.5	51.1	48.6	40.2
1-2	-1973	23.5	21.3	23.8	33.3	10.7	18.1	25.3	23.9	22.3	18.4	13.6	33.3	-	13.0	23.8	22.4
	-1976	23.0	27.0	21.6	25.8	35.1	18.9	24.4	23.2	23.2	21.5	24.1	26.3	37.5	21.3	25.7	23.2
3-8	-1973	22.9	36.0	21.3	24.4	32.1	16.0	23.9	23.3	24.0	39.0	31.8	33.3	28.6	30.4	25.8	24.9
	-1976	23.2	33.8	24.5	25.8	29.7	11.6	17.0	23.3	24.7	33.7	34.5	18.4	45.8	21.3	18.3	25.2
9 or more	-1973	7.1	17.0	11.3	11.5	17.9	6.4	6.1	7.1	11.7	25.7	18.2	16.7	28.6	8.7	15.0	12.8
	-1976	7.0	16.2	5.9	7.7	8.1	7.4	3.7	7.2	10.7	23.0	3.4	21.1	4.2	6.4	7.3	11.5
Total Number Responding	-1973	15,349	394	80	78	28	94	4,595	20,618	3,574	136	22	12	7	23	982	4,756
	-1976	16,872	582	102	155	37	95	536	18,379	5,371	395	29	38	24	47	109	6,013
Unknown	-1973	669	33	4	-	1	5	417	1,129	183	14	2	4	-	1	117	321
	-1976	872	54	8	11	3	4	265	1,217	346	34	6	2	1	3	82	474

1/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

I-15 Percentage Distribution of Doctorate Recipients in 1973 and 1976 by Years Out of School[1] between Entrance to Graduate School and Ph.D. by Sex and Racial/Ethnic Group as Percentage of Total Responding

Racial/Ethnic Group Differences

A higher proportion of Asians than of any other group took no time out between enrollment in graduate school and the completion of the degree. A lower proportion of Blacks than all others took no time out and a higher proportion of Blacks than of other groups spent nine years or more out of school after beginning graduate study.

Sex Differences

A smaller proportion of women than men completed the Ph.D. with no time out of school after starting graduate school and a higher proportion of women than men spent nine years or more out of school. Comparison with Table I-15, which gives time elapsed between completion of the baccalaureate and entrance into graduate school, indicates that a smaller percentage of women than of men began graduate work immediately but the proportion of women who took no time out after enrollment was closer to the proportion of men.

Sex Differences within Racial/Ethnic Groups

Among Blacks, the difference between the distribution of "years out" for men and women narrowed from 1973 to 1976. In 1976, a larger proportion of women had taken no time out during graduate study. At the other extreme, in 1976 the proportion of women, 23.0%, who had spent nine years or more out of school following graduate enrollment was still much higher than the 16.2% for men.

Examination of the four-year totals available in the CHR shows the Puerto Ricans to have the largest sex differences at both ends of the distribution of "years out". In this group, 41.4% of the men but only 16.7% of the women took no time out during graduate work, while 8.3% of the men and 16.7% of the women spent nine years or more away from graduate study. For Blacks, the sex difference is similar at the high end of the time distribution: 15.9% of the men and 24.5% of the women had at least nine years away from degree work.

---

[1] It should not be overlooked that there is considerable variability among fields in "years out of school," see p. 143.

I-16 Percentage of Doctorate Recipients in 1973-1976 by Sources of Support in Graduate School, by Sex and Racial/Ethnic Group

Racial/Ethnic Group Differences

A larger proportion of Asians received federal fellowships/traineeships and research assistantships than of the members of other groups, possibly because of their concentration in fields in which such support is more available (see Table I-11). They have depended less on the GI Bill, other fellowships or loans (see Table I-16). Whites and American Indians are the groups with the highest proportions that have held teaching assistantships. Blacks have relied heavily on the GI Bill and have obtained little support from family contributions, teaching assistantships and research assistantships. A larger proportion of Puerto Ricans than of other groups has had support from "other fellowships" and from educational/institutional funds. American Indians have depended to a greater extent than other groups on their own and their spouses' contributions.

Sex Differences

There has been little difference between the proportions of men and women Ph.D.'s receiving federal fellowship/traineeship support and very small differences in receipt of educational/institutional funds and self-support. The GI Bill is used primarily by men and larger proportions of men than women have turned to loans and have obtained teaching and research assistantships. Women have relied to a greater extent on "other fellowships" and family contributions.

Sex Differences within Racial/Ethnic Groups

Because of the small numbers of minority women other than Blacks, the combined four-year figures available in the CHR were examined. Among American Indians, 44.1% of the men had federal fellowships/traineeships but only 33.6% of the women. The situation was similar for Puerto Ricans: 33.8% of the men and 21.3% of the women had federal fellowships/traineeships. Among Asians, the situation was reversed with 53.3% of the women having such awards but only 43.8% of the men. A higher proportion of Asian women than men also had loans: 19.7% of the women and 14.6% of the men. On the other hand, 46.9% of Asian men held research assistantships but only 32.1% of the women, even though the latter figure is higher than the percentage for any other group of women.

Table I-16
Percentage of Doctorate Recipients 1/ in 1973-1976 by Sources of Support in Graduate School, by Sex and Racial/Ethnic Group

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Source of Support	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Federal Fel/TR																
-1973	43.2%	33.0%	50.6%	46.2%	37.9%	48.0%	46.3%	43.7%	43.5%	30.3%	26.1%	30.8%	16.7%	72.7%	43.8%	43.2%
-1974	41.7	34.2	52.1	33.9	42.1	41.1	46.8	41.7	39.9	40.0	52.2	34.8	18.8	50.0	39.9	39.9
-1975	38.8	29.7	34.9	37.4	27.1	43.6	40.3	38.6	38.4	29.4	32.3	41.4	21.4	54.3	42.3	38.0
-1976	34.6	29.0	41.3	29.0	30.8	42.9	38.5	34.6	34.6	34.2	27.3	28.2	24.0	44.0	31.3	34.5
G.I. bill																
-1973	14.7	22.4	17.3	24.4	10.3	11.2	14.6	14.8	.4	1.4	-	-	-	-	.7	.5
-1974	16.2	25.8	19.8	24.0	18.4	8.4	15.8	16.4	.4	.4	-	-	-	-	.6	.4
-1975	17.4	22.3	29.4	14.3	16.7	17.0	13.5	17.5	.8	.3	3.2	-	-	-	.9	.8
-1976	18.1	26.9	17.4	19.1	17.9	13.3	11.5	18.2	.7	1.4	3.0	2.6	-	-	1.0	.8
Other Fellowship																
-1973	21.3	25.1	24.7	15.4	41.4	21.4	20.8	21.3	27.6	33.8	17.4	23.1	16.7	9.1	22.7	26.6
-1974	20.6	27.5	15.6	25.6	21.1	16.8	22.9	20.9	27.9	29.2	34.8	26.1	43.8	15.6	24.1	27.8
-1975	22.3	25.6	25.7	32.0	39.6	27.7	30.4	22.8	25.6	30.0	19.4	27.6	28.6	28.6	33.3	26.0
-1976	22.1	24.1	21.1	25.9	23.1	17.3	29.9	22.3	26.8	28.0	21.2	30.8	28.0	26.0	37.5	27.0
Teaching Asst.																
-1973	49.8	31.6	50.6	43.6	41.4	53.1	50.9	49.7	46.6	34.5	56.5	61.5	66.7	22.7	48.0	46.6
-1974	50.8	32.7	50.0	47.1	42.1	45.8	52.7	50.3	48.6	26.3	47.8	43.5	31.3	40.6	53.2	47.5
-1975	53.2	30.7	62.4	42.9	33.3	41.5	59.3	52.5	51.3	31.2	45.2	48.3	35.7	48.6	51.4	50.1
-1976	53.0	30.1	46.8	45.1	35.9	52.0	62.3	52.4	49.4	26.1	66.7	30.8	24.0	58.0	43.8	47.7
Research Asst.																
-1973	33.6	18.6	34.6	24.4	24.1	45.9	34.6	33.5	21.2	12.0	21.7	7.7	16.7	40.9	20.9	21.0
-1974	33.3	17.7	27.1	23.1	26.3	44.9	31.9	32.7	22.9	12.1	8.7	13.0	31.3	31.3	22.2	22.3
-1975	37.9	20.3	23.9	29.9	18.8	50.0	37.1	37.2	24.8	12.7	32.3	24.1	21.4	25.7	29.7	24.2
-1976	38.8	18.3	33.9	28.4	23.1	46.9	41.2	38.1	26.8	13.2	24.2	23.1	8.0	32.0	21.9	25.7
Educ/Inst Fund																
-1973	12.8	19.5	17.3	11.5	10.3	12.2	12.6	12.9	12.5	19.7	17.4	15.4	16.7	9.1	16.5	13.5
-1974	12.1	14.7	12.5	10.7	18.4	16.8	11.2	12.2	13.1	14.2	13.0	4.3	18.8	15.6	11.4	13.1
-1975	13.3	16.7	11.0	16.3	22.9	11.7	13.5	13.5	14.0	19.7	16.1	17.2	14.3	17.1	10.8	14.3
-1976	13.1	13.8	11.9	13.0	20.5	14.3	11.3	13.1	14.0	18.9	18.2	12.8	28.0	4.0	11.5	14.3
Own/Spouse																
-1973	51.1	50.6	45.7	47.4	37.9	45.9	50.3	50.9	53.8	44.4	69.6	53.8	-	45.5	49.9	52.7
-1974	53.2	50.7	61.5	53.7	44.7	46.7	52.5	53.1	55.8	55.0	56.5	43.5	43.8	65.6	51.3	55.6
-1975	70.7	68.5	76.1	69.4	66.7	56.4	64.3	70.4	69.4	61.8	64.5	72.4	57.1	60.0	59.5	68.7
-1976	75.2	70.2	86.2	70.4	64.1	57.1	69.7	74.8	74.4	67.7	69.7	71.8	68.0	66.0	64.6	73.7

1/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

Table I-16 continued
Percentage of Doctorate Recipients 1/ in 1973-1976 by Sources of Support in Graduate School, by Sex and Racial/Ethnic Group

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Source of Support	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Family Contrib.																
-1973	6.8%	3.4%	4.9%	5.1%	6.9%	5.1	7.5%	6.9%	9.2%	2.8%	4.3%	7.7%	-	9.1%	9.0%	9.0%
-1974	6.9	3.2	6.3	5.8	5.3	6.5	7.1	6.8	9.2	4.2	-	13.0	12.5%	9.4	7.0	8.9
-1975	14.7	9.5	18.3	10.2	16.7	14.9	15.8	14.5	16.6	9.1	16.1	17.2	28.6	17.1	14.4	16.1
-1976	17.1	9.1	12.8	13.6	12.8	19.4	18.2	16.9	19.8	13.4	21.2	17.9	16.0	16.0	17.7	19.3
Loans 2/																
-1973	14.1	19.3	19.8	20.5	13.8	11.2	15.5	14.6	9.9	16.9	21.7	7.7	-	13.6	12.2	10.6
-1974	15.0	20.4	12.5	19.0	26.3	13.1	15.1	15.1	12.3	15.0	17.4	21.7	12.5	6.3	13.3	12.5
-1975	24.4	32.8	34.9	29.9	25.0	18.1	21.5	24.6	18.3	25.2	35.5	20.7	42.9	34.3	18.9	18.9
-1976	26.9	34.5	36.7	36.4	30.8	16.3	24.5	27.2	22.2	28.9	33.3	20.5	20.0	20.0	34.4	22.9
Other																
-1973	3.6	3.9	6.2	3.8	10.3	1.0	4.2	3.8	5.6	4.2	4.3	7.7	-	-	5.3	5.5
-1974	3.4	4.3	4.2	7.4	10.5	6.5	3.8	3.5	5.4	5.0	8.7	-	-	6.3	4.4	5.3
-1975	4.3	6.9	8.3	5.4	4.2	2.1	6.3	4.5	6.2	7.0	3.2	3.4	14.3	14.3	5.4	6.3
-1976	4.9	6.0	5.5	10.5	10.3	4.1	6.3	5.1	6.8	8.1	9.1	10.3	16.0	2.0	9.4	6.9
Total Reporting																
-1973	15,706	415	81	78	29	98	4,631	21,038	3,638	142	23	13	6	22	974	4,818
-1974	17,545	538	96	121	38	107	770	19,215	4,405	240	23	23	16	32	158	4,897
-1975	17,846	610	109	147	48	94	526	19,380	5,362	330	31	29	14	35	111	5,912
-1976	17,575	618	109	162	39	98	478	19,079	5,639	418	33	39	25	50	96	6,300
No Report																
-1973	312	12	3	-	-	1	381	709	119	8	1	3	1	2	125	259
-1974	371	22	2	2	-	1	472	870	157	19	-	2	1	1	105	285
-1975	184	20	3	-	-	-	301	508	84	9	-	-	-	1	95	189
-1976	169	18	1	4	1	1	323	517	78	11	2	1	-	-	95	187

1/ Native-born U.S. citizens only

Table I-17
Postdoctoral Employment and Study Plans of Doctorate Recipients 1/ by Sex and Racial/Ethnic Group in Fiscal Years 1973-1976 (Percent of Total Responses)

	Men								Women							
	Racial/Ethnic Group								Racial/Ethnic Group							
Postdoctoral Plans	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Definite Employment																
- 1973	67.5%	65.1%	70.4%	64.9%	79.3%	53.8%	69.7%	67.9%	58.2%	65.0%	45.8%	42.9%	33.3%	43.5%	62.3%	59.0%
- 1974	66.9	70.7	64.9	70.5	66.7	51.0	61.9	66.7	58.2	60.4	65.2	64.0	75.0	63.6	57.6	58.5
- 1975	65.3	65.7	56.6	65.7	83.0	63.3	59.3	68.8	58.5	67.6	58.1	70.4	75.0	51.5	58.3	59.1
- 1976	62.7	65.8	55.7	66.5	68.4	44.8	55.1	62.5	57.8	65.5	54.3	68.4	79.2	52.1	63.3	58.5
Definite Study																
- 1973	11.9	6.7	8.6	14.3	6.9	21.5	11.4	11.8	9.7	4.9	16.7	14.3	-	26.1	8.7	9.4
- 1974	10.8	4.6	6.2	7.4	13.9	17.3	12.3	10.7	9.7	6.4	4.3	4.0	-	12.1	8.9	9.5
- 1975	12.3	4.4	10.4	11.9	2.1	21.1	16.4	12.8	10.2	2.8	12.9	7.4	8.3	24.2	10.2	9.9
- 1976	13.7	4.1	6.6	8.9	7.9	30.2	18.1	13.5	9.8	3.0	5.7	-	4.2	14.6	8.9	9.3
Seeking Employment																
- 1973	17.3	25.2	18.5	16.9	10.3	15.1	16.2	17.2	28.1	28.0	33.3	35.7	50.0	26.1	25.5	27.6
- 1974	18.9	23.1	23.7	17.2	13.9	22.1	21.7	19.2	28.4	31.2	30.4	32.0	25.0	18.2	29.1	28.5
- 1975	19.1	27.4	27.4	16.1	10.6	14.4	20.8	20.4	27.7	28.1	25.8	18.5	16.7	15.2	26.9	27.5
- 1976	19.9	27.3	31.1	20.9	23.7	19.8	22.0	20.3	28.7	28.5	37.1	26.3	16.7	31.3	23.3	28.6
Seeking Study																
- 1973	3.3	2.9	2.5	3.9	3.4	9.7	2.7	3.2	4.1	2.1	4.2	7.1	16.7	4.3	3.5	3.9
- 1974	3.4	1.5	5.2	4.9	5.6	9.6	4.1	3.4	3.7	2.0	-	-	-	6.1	4.4	3.6
- 1975	3.3	2.5	5.7	6.3	4.3	1.1	3.6	3.5	3.6	1.5	3.2	3.7	-	9.1	4.6	3.6
- 1976	3.7	2.8	6.6	3.8	-	5.2	4.8	3.7	3.7	3.0	2.9	5.3	-	2.1	4.4	3.6
Total Reported																
- 1973	15,635	416	81	77	29	93	4,601	20,932	3,620	143	24	14	6	23	955	4,785
- 1974	17,515	540	97	122	36	104	764	19,178	4,393	250	23	25	16	33	158	4,898
- 1975	17,572	609	106	143	47	90	501	18,068	5,204	324	31	27	12	33	108	5,739
- 1976	17,229	611	106	158	38	96	454	18,692	5,467	403	35	38	24	48	90	6,105
Not Reported																
- 1973	383	11	3	1	-	6	411	815	137	7	-	2	1	1	144	292
- 1974	401	20	1	1	2	4	478	907	169	9	-	-	1	-	105	284
- 1975	458	21	6	4	1	4	326	820	242	15	-	2	2	3	98	362
- 1976	515	25	4	8	2	3	347	904	250	26	-	2	1	2	101	382

1/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

I-17 Postdoctoral Employment and Study Plans of Doctorate Recipients by Sex and Racial/Ethnic Group in Fiscal Years 1973-1976

Racial/Ethnic Group Differences

The Puerto Ricans are the group showing the largest proportions with definite [1/] employment plans at the time of the degree. Asians include the largest proportions of individuals with plans for study after obtaining the doctorate, whether intended or definite plans. They are highly concentrated in fields in which postdoctoral study is common (see Table I-11). American Indians show the highest proportion still seeking employment at the time the doctorate is awarded.

Sex Differences

Greater proportions of men than women have definite plans for both employment and study following the degree and lower proportions of men are still seeking employment. There is virtually no difference between the sexes in seeking study. Over the four-year period, the percentage of men with definite employment dropped and the percentages with definite study plans or seeking employment increased while the percentages for women were relatively stable. The net result was a decrease in the difference between men and women in the proportions with definite study and employment plans. In 1973, 79.7% of the men and 68.5% of the women had definite plans while in 1976, 76.0% of the men and 67.8% of the women had such commitments.

Sex Differences within Racial/Ethnic Groups

Inspection of the total figures for the four years shows the White group with the largest difference between the sexes in the proportions with definite plans upon completion of the degree: 77.8% of the men and 68.1% of the women. The smallest differences were in the Black group in which both sexes showed low figures

---

[1/] Individuals with definite plans are those who responded "Have signed contract or made definite commitment" while those seeking replied that they were "Negotiating, seeking or other." (See Appendix C.)

for study commitments but high ones for employment. Only 4.8% of the men and 3.9% of the women had plans for further study but 66.9% of Black men and 64.9% of Black women had obtained employment.

CHAPTER II

WOMEN AND MINORITY PH.D.'S IN THE LABOR FORCE

This chapter reports the activities and status of women and minority doctoral scientists and engineers in the labor force following receipt of the degree.

Tables II-1 and II-2 describe the fields of employment of these scientists by racial/ethnic group and citizenship, and by sex and citizenship. Native-born U.S. citizens are compared with foreign-born U.S. citizens and with foreign citizens to provide some perspective on the position of the native-born in the scientific labor force as a whole.

Tables II-3 and II-5 present a picture of the employment sectors and work activities of Whites and minority scientists in the labor force in 1975 while Table II-4 presents the same topics for men and women among native-born U.S. citizens in 1973 and 1975.

Tables II-6 and II-7 provide median salaries by racial/ethnic group and sex among all native-born doctoral scientists and engineers and then, among recent degree recipients employed in academia.

Tables II-8 examines the employment status of native-born scientists, whether in or out of the labor force, by racial/ethnic group and sex while Table II-9 describes the extent of unemployment among scientists in the labor force.

Since all these tables are derived from the Comprehensive Roster Survey, it should be recalled that the data are subject to sampling error. When it is greater than one percentage point, this is indicated by appropriate footnotes. The individuals covered by the survey are from all cohorts from 1930 to 1974.

Table II-1a

Field of Employment of Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/Place of Birth and Racial/Ethnic Group (Number and Percent)

Native-Born U.S. Citizens

Racial/Ethnic Group

Field of Employment		White	Black	Amer. Indian	His-panic	Asian	Total Reptd	Other & Unk.	Total All
MATHEMATICS	N	1981	34	5	13	8	2041	102	2143
	WN	13102	121	22	66	28	13339	648	13987
	H	98.2	.9	.2	.5	.2	100.0		
PHYSICS	N	1725	15	2	4	10	1756	77	1833
	WN	13283	89	13	22	78	13485	606	14091
	H	98.5	.7	.1	.2	.6	100.0		
CHEMISTRY	N	3270	62	8	17	27	3384	112	3496
	WN	26011	338	41	84	173	26647	796	27443
	H	97.6	1.3	.2	.3	.6	100.0		
EARTH SCIENCES	N	1343	9	1	4	5	1362	45	1407
	WN	9891	41	1	15	25	9973	350	10323
	H	99.2	.4		.2	.3	100.0		
ENGINEERING	N	3264	23	10	20	26	3343	102	3445
	WN	30929	105	53	99	246	31432	948	32380
	H	98.4	.3	.2	.3	.8	100.0		
BIOSCIENCES	N	8435	162	16	50	111	8774	310	9084
	WN	51798	625	87	210	536	53256	1947	55203
	H	97.3	1.2	.2	.4	1.0	100.0		
PSYCHOLOGY	N	3447	59	15	16	26	3563	193	3756
	WN	24627	270	71	78	135	25181	1317	26498
	H	97.8	1.1	.3	.3	.5	100.0		
SOCIAL SCIENCES	N	2936	63	16	18	22	3055	136	3191
	WN	24756	331	100	79	120	25386	1039	26425
	H	97.5	1.3	.4	.3	.5	100.0		
ALL OTHER FIELDS	N	1382	29	2	13	8	1434	56	1490
	WN	10838	220	15	56	71	11200	397	11597
	H	96.8	2.0	.1	.5	.6	100.0		
UNKNOWN	N	357	12	5	4	1	379	38	417
	WN	2403	55	22	15	5	2500	250	2750
	H	96.1	2.2	.9	.6	.2	100.0		
NOT EMPLOYED	N	2092	26	3	7	8	2136	159	2295
	WN	12010	121	15	23	19	12188	932	13120
	H	98.5	1.0	.1	.2	.2	100.0		
TOTAL	N	30232	494	83	166	252	31227	1330	32557
	WN	219648	2316	440	747	1436	224587	9230	233817
	H	97.8	1.0	.2	.3	.6	100.0		

Source: Survey of Doctoral Scientists and Engineers, National Research Council

II-1 Field of Employment of Doctoral Scientists and Engineers in the U.S. Labor Force in 1975[1] by Citizenship/Place of Birth and Racial/Ethnic Group

Racial/Ethnic Group Differences

For the total of the three citizenship groups, the employment field having the largest representation of White and Hispanic doctoral scientists and engineers reporting employment is the biological sciences: 25.0% ± 0.2% of the Whites and 28.3% ± 3.1% of the Hispanics. Engineering with 32.0% ± 1.0% of the Asians is the leading field for this group.

Citizenship Differences

Among native-born U.S. citizens, the most frequent employment field is the biological sciences with engineering in second place. Psychology is the smallest employment field among foreign citizens.

Citizenship Differences within Racial/Ethnic Groups

Among employed native-born U.S. scientists and engineers the proportion of minority group members is very low, ranging from 0.8% ± 0.2% in the earth sciences to only 2.7% ± 0.2% in the biological sciences, but these fields do not differ significantly from the fields with the closest percentages. Among foreign-born U.S. citizens, engineering shows the largest proportion, 40.7% ± 1.9% of minority doctorates in the labor force.

Of Whites who are native-born or foreign citizens, the largest numbers report employment as biological scientists, while among foreign-born U.S. citizens, this field shares the top position with engineering. For both Blacks and Hispanics, the biological sciences also occupy first place among the native-born.

Native-born Asians are also most frequently employed in the biological sciences, but in the other two citizenship categories, engineering is their leading employment field. In fact, among foreign citizens, Asians constitute 56.8% of the engineers, the only field of any citizenship type in which minority representation is greater than that of Whites.

---

[1] The number of minority members in the 1973 sample was too small to permit comparison of data from the 1973 and 1975 surveys.

Table II-1b
Field of Employment of Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/Place of Birth and Racial/Ethnic Group (Number and Percent)

Foreign-Born U.S. Citizens

Racial/Ethnic Group

Field of Employment		White	Black	Amer. Indian	His-panic	Asian	Total Reptd.	Other & Unk.	Total All
MATHEMATICS	N	217			2	70	289	24	313
	WN	1120			6	351	1477	105	1582
	H	75.8[a]			.4	23.8[a]	100.0		
PHYSICS	N	227	2		1	70	300	14	314
	WN	1470	13		1	458	1942	112	2054
	H	75.7[a]	.7		.1	23.6[a]	100.0		
CHEMISTRY	N	366			5	130	501	17	518
	WN	2380			25	814	3219	117	3336
	H	73.9[a]			.8	25.3[a]	100.0		
EARTH SCIENCES	N	157				24	181	8	189
	WN	766				126	892	45	937
	H	85.9[a]				14.1[a]	100.0		
ENGINEERING	N	451	1		5	243	700	30	730
	WN	3042	11		21	2059	5133	233	5366
	H	59.3[a]	.2		.4	40.1[a]	100.0		
BIOSCIENCES	N	701	5	1	9	219	935	37	972
	WN	3553	18	8	35	1104	4718	206	4924
	H	75.3[a]	.4	.2	.7	23.4[a]	100.0		
PSYCHOLOGY	N	257			4	17	278	21	299
	WN	1441			16	67	1524	101	1625
	H	94.6[a]			1.0	4.4[a]	100.0		
SOCIAL SCIENCES	N	325	6	1	5	68	405	25	430
	WN	2196	25	1	25	549	2796	171	2967
	H	78.5[a]	.9		.9	19.6[a]	100.0		
ALL OTHER FIELDS	N	102	3		1	17	123	5	128
	WN	664	14		2	126	806	13	819
	H	82.4[a]	1.7[a]		.2	15.6[a]	100.0		
UNKNOWN	N	52			2	15	69	9	78
	WN	253			6	84	343	45	388
	H	73.8[b]			1.7[a]	24.5[b]	100.0		
NOT EMPLOYED	N	290	1			40	331	24	355
	WN	1364	2			169	1535	96	1631
	H	88.9[a]	.1			11.0[a]	100.0		
TOTAL	N	3145	18	2	34	913	4112	214	4326
	WN	18249	83	9	137	5907	24385	1244	25629
	H	74.8	.3		.6	24.2	100.0		

a Sampling error between 1 and 5 percentage points
b Sampling error between 5 and 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

Table II-1c
Field of Employment of Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/Place of Birth and Racial/Ethnic Group (Number and Percent)'

Foreign Citizens

Racial/Ethnic Group

Field of Employment		White	Black	Amer. Indian	His-panic	Asian	Total Reptd.	Other & Unk.	Total All
MATHEMATICS	N	119	2		3	108	232	11	243
	WN	575	6		11	506	1098	43	1141
	H	52.4[a]	.5		1.0	46.1[a]	100.0		
PHYSICS	N	155				92	247	13	260
	WN	900				543	1443	87	1530
	H	62.4[a]				37.6[a]	100.0		
CHEMISTRY	N	202	3		3	139	347	14	361
	WN	1162	7		12	740	1921	89	2010
	H	60.5[a]	.4		.6	38.5[a]	100.0		
EARTH SCIENCES	N	131				38	169	7	176
	WN	576				161	737	50	787
	H	78.2[a]				21.8[a]	100.0		
ENGINEERING	N	204	6		3	202	415	19	434
	WN	1356	22		15	1832	3225	178	3403
	H	42.0[a]	.7		.5	56.8[a]	100.0		
BIOSCIENCES	N	369	13		6	290	678	32	710
	WN	2085	47		17	1449	3598	165	3763
	H	57.9[a]	1.3		.5	40.3[a]	100.0		
PSYCHOLOGY	N	65	2		1	18	86	10	96
	WN	310	7		13	81	411	36	447
	H	75.4[a]	1.7[a]		3.2[a]	19.7[a]	100.0		
SOCIAL SCIENCES	N	131	10		3	62	206	19	225
	WN	906	60		17	445	1428	151	1579
	H	63.4[a]	4.2[a]		1.2	31.2[a]	100.0		
ALL OTHER FIELDS	N	32				14	46	5	51
	WN	186				112	298	45	343
	H	62.4[b]				37.6[b]	100.0		
UNKNOWN	N	20	2			12	34	2	36
	WN	81	16			63	160	9	169
	H	50.6[b]	10.0[b]			39.4[b]	100.0		
NOT EMPLOYED	N	44				47	91	12	103
	WN	190				163	353	76	429
	H	53.8[b]				46.2[b]	100.0		
TOTAL	N	1472	38		19	1022	2551	144	2695
	WN	8327	165		85	6095	14672	929	15601
	H	56.8	1.1		.6	41.5	100.0		

[a] Sampling error between 1 and 5 percentage points
[b] Sampling error between 5 and 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

II-2 Field of Employment of Doctoral Scientists and Engineers in the U.S. Labor Force in 1973 and 1975 by Citizenship/Place of Birth and Sex

This table is included to show the size of the group of native-born U.S. Ph.D.'s relative to the total group of doctoral scientists and engineers in the United States. The sex differences within citizenship groups serve to illustrate the differences between native-born U.S. citizens and other citizenship groups.

Sex Differences

In the sciences and engineering, the employment field with the largest number of women Ph.D.'s in both 1973 (see p. 70) and 1975 (see p. 71) was the biosciences. The smallest was engineering (although not significantly different from earth sciences in 1975). These figures reflect the fields in which women obtained their degrees. The largest number of male Ph.D.'s was also found in the biosciences, but among males, engineering occupied second place.

Engineering was the field employing the smallest percentage of women while psychology employed the largest percentage. From 1973 to 1975, the total for the four citizenship classes for every field except "other" showed an increase in the estimated percentage of Ph.D.'s who were women, although the increases in mathematics, physics, earth sciences and engineering were not statistically significant. The employment fields showing the biggest increase in the proportion of women were psychology and the social sciences.

Sex Differences within Citizenship Groups

A comparison of citizenship groups with respect to the percentage of women in the different employment fields shows little variation. The largest differences occurring between the native-born and foreign-born citizenship classes are in psychology. In the latter citizenship group, psychology had a higher proportion of women in both years. From 1973 to 1975, the greatest single percentage change occurred among foreign citizens where the number and percentage of women doctorate recipients in the social sciences more than doubled.

Table II-2a
Field of Employment of Doctoral Scientists and Engineers in the U.S. Labor Force in 1973 by Citizenship/Place of Birth and Sex
(Number and Percent)

Field of Employment		Native-Born U.S. Citizens			Foreign-Born U.S. Citizens			Foreign Citizens			Citizenship Unknown		
		MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
MATHEMATICS	N	1699	408	2107	240	42	282	204	39	243	9	4	13
	WN	11861	711	12572	1262	71	1333	1050	65	1115	72	8	80
	H	94.3	5.7	100.0	94.7[a]	5.3[a]	100.0	94.2[a]	5.8[a]	100.0	90.0[b]	10.0[b]	100.0
PHYSICS	N	1656	173	1829	289	22	311	265	35	300	21	4	25
	WN	13068	281	13349	1815	39	1854	1615	59	1674	145	6	151
	H	97.9	2.1	100.0	97.9	2.1	100.0	96.5[a]	3.5[a]	100.0	96.0[a]	4.0[a]	100.0
CHEMISTRY	N	2622	403	3025	351	66	417	290	48	338	29	7	36
	WN	22158	963	23121	2342	145	2487	1861	97	1958	240	31	271
	H	95.8	4.2	100.0	94.2[a]	5.8[a]	100.0	95.0[a]	5.0[a]	100.0	88.6[b]	11.4[b]	100.0
EARTH SCIENCES	N	1218	123	1341	145	11	156	168	12	180	10	2	12
	WN	8674	214	8888	642	19	661	655	23	678	48	7	55
	H	97.6	2.4	100.0	97.1[a]	2.9[a]	100.0	96.6[a]	3.4[a]	100.0	87.3[b]	12.7[b]	100.0
ENGINEERING	N	3192	52	3244	582	16	598	368	17	385	37		37
	WN	27465	88	27553	3982	24	4006	2621	22	2643	341		341
	H	99.7	.3	100.0	99.4	.6	100.0	99.2	.8	100.0	100.0		100.0
BIOSCIENCES	N	7076	1418	8494	637	205	842	560	161	721	124	24	148
	WN	43764	4590	48354	3444	567	4011	3185	425	3610	675	106	781
	H	90.5	9.5	100.0	85.9[a]	14.1[a]	100.0	88.2[a]	11.8[a]	100.0	86.4[a]	13.6[a]	100.0
PSYCHOLOGY	N	2346	1195	3541	160	101	261	64	24	88	30	19	49
	WN	18359	4175	22534	953	364	1317	346	83	429	223	83	306
	H	81.5	18.5	100.0	72.4[a]	27.6[a]	100.0	80.7[a]	19.3[a]	100.0	72.9[b]	27.1[b]	100.0
SOCIAL SCIENCES	N	2274	694	2968	319	59	378	174	29	203	38	14	52
	WN	19888	2314	22202	2161	179	2340	1211	77	1288	308	40	348
	H	89.6	10.4	100.0	92.4[a]	7.6[a]	100.0	94.0[a]	6.0[a]	100.0	88.5[a]	11.5[a]	100.0
ALL OTHER FIELDS	N	1093	344	1437	97	29	126	41	10	51	32	6	38
	WN	8702	1036	9738	587	93	680	248	25	273	216	17	233
	H	89.4	10.6	100.0	86.3[a]	13.7[a]	100.0	90.8[a]	9.2[a]	100.0	92.7[a]	7.3[a]	100.0
UNKNOWN	N	336	83	419	69	13	82	34	9	43	12	5	17
	WN	2467	221	2688	382	33	415	263	19	282	75	12	87
	H	91.8[a]	8.2[a]	100.0	92.0[a]	8.0[a]	100.0	93.3[a]	6.7[a]	100.0	86.2[b]	13.8[b]	100.0
NOT EMPLOYED	N	1615	951	2566	267	129	396	84	79	163	143	112	255
	WN	11407	2892	14299	1352	335	1687	469	213	682	1026	462	1488
	H	79.8	20.2	100.0	80.1[a]	19.9[a]	100.0	68.8[a]	31.2[a]	100.0	69.0[a]	31.0[a]	100.0
TOTAL	N	25127	5844	30971	3156	693	3849	2252	463	2715	485	197	682
	WN	187813	17485	205298	18922	1869	20791	13524	1108	14632	3369	772	4141
	H	91.5	8.5	100.0	91.0	9.0	100.0	92.4	7.6	100.0	81.4[a]	18.6[a]	100.0

[a] Sampling error between 1 and 5 percentage points
[b] Sampling error between 5 and 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

Table II-2b

Field of Employment of Doctoral Scientists and Engineers in the U.S. Labor Force in 1975 by Citizenship/Place of Birth and Sex (Number and Percent)

Field of Employment		Native-Born U.S. Citizens			Foreign-Born U.S. Citizens			Foreign Citizens			Citizenship Unknown		
		MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
MATHEMATICS	N	1700	443	2143	261	52	313	200	43	243	12	7	19
	WN	13178	809	13967	1495	87	1582	1059	82	1141	91	14	105
	%	94.2	5.8	100.0	94.5[a]	5.5[a]	100.0	92.8[a]	7.2[a]	100.0	86.7[b]	13.3[b]	100.0
PHYSICS	N	1637	196	1833	286	28	314	236	24	260	21	6	27
	WN	13757	334	14091	2004	50	2054	1484	46	1530	195	10	205
	%	97.6	2.4	100.0	97.6	2.4	100.0	97.0[a]	3.0[a]	100.0	95.1[a]	4.9[a]	100.0
CHEMISTRY	N	2955	541	3496	425	93	518	295	66	361	31	6	37
	WN	26084	1359	27443	3089	247	3336	1849	161	2010	271	17	288
	%	95.0	5.0	100.0	92.6[a]	7.4[a]	100.0	92.0[a]	8.0[a]	100.0	94.1[a]	5.9[a]	100.0
EARTH SCIENCES	N	1261	146	1407	176	13	189	160	16	176	15		15
	WN	10031	292	10323	915	22	937	756	31	787	102		102
	%	97.2	2.8	100.0	97.7[a]	2.3[a]	100.0	96.1[a]	3.9[a]	100.0	100.0		100.0
ENGINEERING	N	3362	83	3445	704	26	730	412	22	434	45	1	46
	WN	32225	155	32380	5325	41	5366	3363	40	3403	462	5	467
	%	99.5	.5	100.0	99.2	.8	100.0	98.8	1.2	100.0	98.9[a]	1.1[a]	100.0
BIOSCIENCES	N	7421	1663	9084	716	256	972	520	190	710	136	33	169
	WN	49336	5867	55203	4172	752	4924	3258	505	3763	772	131	903
	%	89.4	10.6	100.0	84.7[a]	15.3[a]	100.0	86.6[a]	13.4[a]	100.0	85.5[a]	14.5[a]	100.0
PSYCHOLOGY	N	2485	1271	3756	175	124	299	64	32	96	30	24	54
	WN	21152	5346	26498	1139	486	1625	324	123	447	218	113	331
	%	79.8	20.2	100.0	70.1[a]	29.9[a]	100.0	72.5[a]	27.5[a]	100.0	65.9[b]	34.1[b]	100.0
SOCIAL SCIENCES	N	2382	809	3191	349	81	430	175	50	225	39	21	60
	WN	23256	3169	26425	2697	270	2967	1386	193	1579	350	59	409
	%	88.0	12.0	100.0	90.9[a]	9.1[a]	100.0	87.8[a]	12.2[a]	100.0	85.6[a]	14.4[a]	100.0
ALL OTHER FIELDS	N	1156	334	1490	99	29	128	43	8	51	20	6	26
	WN	10453	1144	11597	731	88	819	323	20	343	175	24	199
	%	90.1	9.9	100.0	89.3[a]	10.7[a]	100.0	94.2[a]	5.8[a]	100.0	87.9[b]	12.1[b]	100.0
UNKNOWN	N	313	104	417	60	18	78	28	8	36	15	3	18
	WN	2428	322	2750	338	50	388	149	20	169	100	15	115
	%	88.3[a]	11.7[a]	100.0	87.1[a]	12.9[a]	100.0	88.2[b]	11.8[b]	100.0	87.0[b]	13.0[b]	100.0
NOT EMPLOYED	N	1392	903	2295	248	107	355	43	60	103	120	81	201
	WN	10106	3014	13120	1316	315	1631	272	157	429	842	338	1180
	%	77.0	23.0	100.0	80.7[a]	19.3[a]	100.0	63.4[a]	36.6[a]	100.0	71.4[a]	28.6[a]	100.0
TOTAL	N	26064	6493	32557	3499	827	4326	2176	519	2695	484	188	672
	WN	212006	21811	233817	23221	2408	25629	14223	1378	15601	3578	726	4304
	%	90.7	9.3	100.0	90.6	9.4	100.0	91.2	8.8	100.0	83.1[a]	16.9[a]	100.0

[a] Sampling error between 1 and 5 percentage points

[b] Sampling error between 5 and 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

Table II-3
Employment Sector of Doctoral Scientists and Engineers by Citizenship/Place of Birth and Racial/Ethnic Group, 1975 (Number and Percent)

Employment Sector		White	Black	Amer. Indian	Hispanic	Asian	Total Reported	Other & Unknown
				Native-Born U.S. Citizens				
Educ. Inst.	WN	121,278	1,448	263	503	776	124,268	5,180
	V	55.2%	62.5%[a]	59.8%[b]	67.3%[a]	54.0%[a]	55.3%	56.1%[a]
Fed. Gov't	WN	16,139	212	24	35	108	16,518	602
	V	7.3	9.2 [a]	5.5 [a]	4.7 [a]	7.5 [a]	7.4	6.5
Business - Industry	WN	51,075	340	79	103	387	51,984	1,696
	V	23.3	14.7 [a]	18.0 [a]	13.8 [a]	26.9 [a]	23.1	18.4 [a]
All Other	WN	19,146	195	59	83	146	19,629	820
	V	8.7	8.4 [a]	13.4 [a]	11.1 [a]	10.2 [a]	8.7	8.9
Employment Not Reported[1/]	WN	12,010	121	15	23	19	12,188	932
	V	5.5	5.2	3.4 [a]	3.1 [a]	1.3	5.4	10.1
Total	N	30,232	494	83	166	252	31,227	1,330
	WN	219,648	2,316	440	747	1,436	224,587	9,230
	V	100.0	100.0	100.1	100.0	99.9	99.9	100.0
				Foreign-Born U.S. Citizens				
Educ. Inst.	WN	9,438	74	9	74	2,955	12,550	675
	V	51.7%	89.2%[b]	100.0%	54.0%[b]	50.0%[a]	51.5	54.3 [a]
Fed. Gov't	WN	1,336	-	-	23	427	1,786	96
	V	7.3			16.8 [b]	7.2	7.3	7.7 [a]
Business - Industry	WN	4,670	7	-	21	1,966	6,664	286
	V	25.6	8.4 [b]		15.3 [b]	33.3 [a]	27.3	23.0 [a]
All Other	WN	1,441	-	-	19	390	1,850	91
	V	7.9			13.9 [b]	6.6	7.6	7.3
Employment Not Reported[1/]	WN	1,364	2	-	-	169	1,535	96
	V	7.5	2.4 [a]			2.9	6.3	7.7
Total	N	3,145	18	2	34	913	4,112	214
	WN	18,249	83	9	137	5,907	24,385	1,244
	V	100.0	100.0	100.0	100.0	100.0	100.0	100.0
				Foreign Citizens				
Educ. Inst.	WN	5,312	137	-	42	3,193	8,684	511
	V	63.8%[a]	83.0%[b]		49.4%[c]	52.4%[a]	59.2%	55.0%[a]
Fed. Gov't	WN	78	3	-	-	108	189	22
	V	.9	1.8 [a]			1.8	1.3	2.4 [a]
Business - Industry	WN	2,144	11	-	15	2,185	4,355	254
	V	25.7 [a]	6.7 [a]		17.6 [b]	35.8 [a]	29.7	27.3 [a]
All Other	WN	603	14	-	28	446	1,091	66
	V	7.2	8.5 [a]		32.9 [c]	7.3	7.4	7.1 [a]
Employment Not Reported[1/]	WN	190	-	-	-	163	353	76
	V	2.3				2.7	2.4	8.2 [a]
Total	N	1,472	38	-	19	1,022	2,551	144
	WN	8,327	165		85	6,095	14,672	929
	V	99.9	100.0		99.9	100.0	100.0	100.0

1/ Includes both unemployed and those not reporting employment

[a] Sampling error between 1 and 5 percentage points
[b] Sampling error between 5 and 10 percentage points
[c] Sampling error greater than 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council

II-3 Employment Sector of Doctoral Scientists and Engineers by Citizenship/Place of Birth and Racial/Ethnic Group, 1975

Citizenship Differences

Doctoral scientists and engineers who are foreign citizens have the largest proportions employed in educational institutions and the lowest proportions working for the Federal government. There are, of course, some limitations on the employment of foreign citizens by the Federal government. Foreign-born U.S. citizens differ from the native-born in having a slightly lower percentage in educational institutions and a higher percentage in business and industry. It should not be overlooked that distribution among employment sectors shows considerable variability among fields and that the three citizenship groups have different field distributions (Table II-1).

Racial/Ethnic Group Differences

At least half of the Ph.D. scientists and engineers in all the racial/ethnic groups are employed in educational institutions with the Black and Hispanic groups having higher proportions employed in this sector than the Whites and Asians. The Black and Hispanic groups also have smaller proportions in business and industry, the sector in which Asians have the highest percentage. (Blacks are slightly, though not significantly, above other groups in percentage employed by the federal government.)

Citizenship Differences within Racial/Ethnic Groups

The percentage of Blacks employed in educational institutions is higher among foreign-born U.S. citizens and foreign citizens than among native-born U.S. citizens. Among Asians, the proportion employed in this sector shows little variation by citizenship status. Among Whites, foreign citizens have the largest proportion in educational institutions. The numbers of Hispanics and American Indians were too small to permit valid comparisons.

Table II-4
Employment Sector and Primary Work Activity of Doctoral Scientists and Engineers 1/ By Sex, 1973 and 1975 (Number and Percent)

Employer Sector and Work Activity		MEN		WOMEN		TOTAL	
		1973	1975	1973	1975	1973	1975
Educ. Insts.	WN	101,731	116,278	10,393	13,170	112,124	129,448
	V%	54.2%	54.8%	59.4%	60.4%	54.6%	55,4%
Research	WN	22,794	25,890	2,294	2,938	25,088	28,828
	V%	12.1	12.2	13.1	13.5	12.2	12.3
Teaching	WN	62,400	71,072	6,395	8,117	68,795	79,189
	V%	33.2	33.5	36.6	37.2	33.5	33.9
Administration	WN	11,447	13,187	806	1,050	12,253	14,237
	V%	6.1	6.2	4.6	4.8	6.0	6.1
All Other	WN	5,090	6,129	898	1,065	5,988	7,194
	V%	2.7	2.9	5.1	4.9	2.9	3.1
Federal Gov't.	WN	14,897	16,229	709	891	15,606	17,120
	V%	7.9	7.7	4.1	4.1	7.6	7.3
Research	WN	7,879	8,239	401	455	8,280	8,694
	V%	4.2	3.9	2.3	2.1	4.0	3.7
Administration	WN	5,160	5,420	173	247	5,333	5,667
	V%	2.7	2.6	1.0	1.1	2.6	2.4
All Other	WN	1,858	2,570	135	189	1,993	2,759
	V%	1.0	1.2	.8	.9	1.0	1.2
Business & Industry	WN	40,367	51,904	701	1,776	41,068	53,680
	V%	21.5	24.5	4.0	8.1	20.0	23.0
Research	WN	12,794	14,940	296	430	13,090	15,370
	V%	6.8	7.0	1.7	2.0	6.4	6.6
Administration	WN	16,109	19,397	134	205	16,243	19,602
	V%	8.6	9.1	.8	.9	7.9	8.4
All Other	WN	11,464	17,567	271	1,141	11,735	18,708
	V%	6.1	8.3	1.5	5.2	5.7	8.0
All Other Employers	WN	19,410	17,489	2,789	2,960	22,199	20,449
	V%	10.3	8.2	16.0	13.6	10.8	8.7
Research	WN	5,664	5,218	699	707	6,363	5,925
	V%	3.0	2.5	4.0	3.2	3.1	2.5
Administration	WN	6,201	6,115	440	705	6,641	6,820
	V%	3.3	2.9	2.5	3.2	3.2	2.9
All Other	WN	7,545	6,156	1,650	1,548	9,195	7,704
	V%	4.0	2.9	9.4	7.1	4.5	3.3
Employment Not Reported 2/	WN	11,407	10,106	2,892	3,014	14,299	13,120
	V%	6.1	4.8	16.5	13.8	7.0	5.6
Total	N	25,127	26,064	5,844	6,493	30,971	32,557
	WN	187,812	212,006	17,484	21,811	205,296	233,817
	V%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

1/ Native-born U.S. citizens only.
2/ Includes unemployed and those not reporting employment status.

Source: Survey of Doctoral Scientists and Engineers, National Research Council.

II-4 Employment Sector and Primary Work Activity of Doctoral Scientists and Engineers by Sex, 1973 and 1975

Sex Differences

For doctoral scientists and engineers, the employment sector showing the largest difference in percentage of men and women employed is business and industry. Although the percentage employed in this sector increased for both sexes from 1973 to 1975, the large difference remained. Men are still three times more likely than women to be employed in this area. Women, however, are less likely than men to be in fields (such as the natural sciences) with numerous industrial employment opportunities (Astin, 1973, p. 147).

With respect to primary work activity, women are far less likely than men to be engaged in administration, a situation that has long prevailed. (Centra, 1974, p. 40; Carnegie, 1973b, p. 123; Kreps, 1971, p. 55). There was a small but significant increase in the proportion of women in administrative activity from 1973 to 1975. However, in the latter year, while 20.8% of the men had such responsibility, the figure for women was still only 10.0%.

The largest reduction of the difference between men and women from 1973 to 1975 was "employment not reported" but the change was small, although significant. Women are still much more likely than men to report being unemployed or not to report at all. A recent study of Ph.D.'s found that those not reporting have higher unemployment rates than those who respond (Centra, 1974, p. 16).

Table II-5
Employment Sector and Primary Work Activity of Doctoral Scientists and Engineers for Whites, Asians and Other Minorities, 1975 [1] (Number and Percent)

Employment Sector		White	Asians	Other Minorities	Total Reporting	Unknown
Educ. Insts.	WN	137,269	6,955	2,798	147,022	6,530
	V%	55.0% [2]	51.5% [2] [a]	65.0% [2] [a]	55.0% [2]	53.9% [2] [a]
Research	WN	31,526	2,592	387	34,505	1,557
	V%	12.6	19.2	9.0	12.9	12.9
Teaching	WN	83,758	3,648	1,751	89,157	3,851
	V%	33.6	27.0 [a]	40.7 [a]	33.4	31.8 [a]
Administration	WN	14,536	302	427	15,265	574
	V%	5.8	2.2	9.9	5.7	4.7
Other	WN	7,449	413	233	8,095	548
	V%	3.0	3.1	5.4	3.0	4.5
Federal Gov't	WN	17,776	656	306	18,738	739
	V%	7.1	4.9	7.1	7.0	6.1
Research	WN	9,138	432	128	9,698	296
	V%	3.7	3.2	3.0	3.6	2.4
Administration	WN	5,810	92	131	6,033	228
	V%	2.3	.7	3.0	2.3	1.9
Other	WN	2,828	132	47	3,007	215
	V%	1.1	1.0	1.1	1.1	1.8
Business-Industry	WN	58,596	4,551	598	63,745	2,337
	V%	23.5	33.7 [a]	13.9 [a]	23.9	19.3
Research	WN	17,017	1,952	180	19,149	634
	V%	6.8	14.5	4.2	7.2	5.2
Administration	WN	21,457	702	206	22,365	713
	V%	8.6	5.2	4.8	8.4	5.9
Other	WN	20,122	1,897	212	22,231	990
	V%	8.1	14.0	4.9	8.3	8.2
Other Employer	WN	21,420	982	423	22,825	1,055
	V%	8.6	7.3	9.8	8.5	8.7
Research	WN	6,264	536	75	6,875	333
	V%	2.5	4.0	1.7	2.6	2.7
Administration	WN	7,116	121	143	7,380	332
	V%	2.9	.9	3.3	2.8	2.7
Other	WN	8,040	325	205	8,570	390
	V%	3.2%	2.4%	4.8%	3.2%	3.2%
No Employment Reported [3]	WN	14,366	359	181	14,906	1,454
	V%	5.8	2.7	4.2	5.6	12.0
Totals	N	35,349	2,197	905	38,451	1,799
	WN	249,427	13,503	4,306	267,236	12,115
	V%	100.0	100.1	100.0	100.0	100.0

[1] All citizens included
[2] Subtotal percentages may differ slightly from sum for activities because of rounding
[3] Includes those who did not report employer and work activity as well as those who reported being unemployed.
[a] Sampling error between 1 and 5 percentage points
[b] Sampling error between 5 and 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council.

II-5 Employment Sector and Primary Work Activity of Doctoral Scientists and Engineers for Whites, Asians and Other Minorities, 1975

Asians are much more likely than Whites or "Other Minorities" to be employed by business and industry. This employment sector draws heavily on natural scientists and engineers, the specialties of numerous Asians. They are more heavily concentrated in research than members of the other groups, less likely to be teaching and much less likely to be engaged in administrative activity.

"Other Minority" (Black, Hispanic and American Indian) scientists and engineers are employed to a much greater extent than the other groups by educational institutions and less by business and industry. They include a larger proportion engaged in teaching and in administration in educational institutions than either Whites or Asians, and a much smaller proportion involved in research in all employment sectors.

1/ The minority members included in the sample were too few in number to permit separate comparisons for each group. Asians have been analyzed separately because of the distinctive characteristics of this group (see Tables I-5 through I-16) and because of their high proportion of foreign citizens (see Table I-2).

Table II-6

Median 1/ Annual Salary by Sex and Racial/Ethnic Group for Doctoral Scientists and Engineers 2/, 1973 and 1975

1973

Sex		Racial/Ethnic Group							
		White	Black	Amer. Indian	Hispanic	Asian	Other	Unknown	Total
Men									
		$20,860	$21,499	$19,370	$18,222	$20,865	* 3/	$20,515	$20,840
	WN	(146,094) 4/	(1,322)	(277)	(519)	(992)	(56)	(4,504)	(153,764)
Women									
		$17,280	$18,608	*	$17,617	$15,817	*	$17,400	$17,306
	WN	(9,958)	(193)	(28)	(46)	(50)	(8)	(327)	(10,610)

1975

Sex		White	Black	Amer. Indian	Hispanic	Asian	Other	Unknown	Total
Men									
		$23,367	$23,672	$21,117	$22,235	$24,120	$20,109	$23,288	$23,360
	WN	(174,147)	(1,680)	(333)	(605)	(1,139)	(91)	(6,332)	(184,327)
Women									
		$18,793	$20,890	$18,450	$20,617	$18,200	*	$20,656	$18,890
	WN	(13,309)	(333)	(34)	(58)	(71)	(7)	(538)	(14,350)

1/ Medians were computed for full-time employed citizens only. Academic year salaries have been multiplied by 11/9 to adjust to a full-year scale.

2/ Native-born U.S. citizens only

3/ Medians have not been calculated with fewer than 10 respondents.

4/ Number employed full-time

Source: Survey of Doctoral Scientists and Engineers, National Research Council.

II-6 Median Annual Salary by Sex and Racial/Ethnic Group for Doctoral Scientists and Engineers, 1973 and 1975

Racial/Ethnic Group Differences

In 1973, the estimated median salary[1] for Black doctoral scientists and engineers of both sexes was greater than that for other groups.

Sex Differences

Among doctoral scientists and engineers, men earned more than women and the difference increased from $3534 in 1973 to $4470 in 1975. The difference partially reflects the fact, documented in numerous studies (American Association of University Professors, 1976; Astin, 1969, p. 92; Astin and Bayer, 1973, p. 339; Bernard, 1964, p. 184; Carnegie, 1973b, pp. 110-111; Centra, 1974, pp. 55-59; Galenson, 1973, p. 26; Kreps, 1971, p. 55; Radcliffe, 1956, p. 34; Robinson, 1973, pp. 207-210) that men hold positions senior to those of women, and the fact that men are more heavily employed in industry (see Table II-4) where salaries are higher.

Sex Differences within Racial/Ethnic Groups

In both years, the largest salary differences between the sexes were found in the Asian group whose men had the second highest estimated median salary in 1973 and the highest estimated median salary in 1975 and whose women had the lowest. The salary level of Asian men partially reflects their concentration, to a greater extent than the men of other groups, in business and industry (see Table II-3) where salaries are higher than in other sectors.

---

[1] Statements in the text for Tables II-6 and II-7 have not been checked for statistical significance. The program for the standard error of a median is currently available in the CHR and the limited resources for this study did not provide for the necessary programming and computer time. The standard error for median salaries is generally small for large samples. A confidence interval has been computed for the median based on the smallest sample in these two tables - the median of $17,263 for Asian women in Table II-7 based on 11 observations. Using the Woodruff formula for estimating the standard error of the median (Hanson, Hurwitz and Madow, 1953, Vol. 1, pp. 448-449), the approximate probability is 2/3 that the true median falls in the interval $16,480-17,793.

Table II-7
Median Annual 1/ Salary by Sex and Racial/Ethnic Group for 1975 of Recent 2/ Doctorate Recipients in Science and Engineering 3/ Employed in Institutions of Higher Education

Sex		Racial/Ethnic Group							
		White	Black	Amer. Indian	Hispanic	Asian	Other	Unknown	Total
Total		$17,179	$18,774	$17,269	$17,144	$16,568	* 4/	$17,479	$17,213
	WN	(31,479) 5/	(537)	(75)	(176)	(133)	(36)	(908)	(33,344)
Male		$17,294	$18,891	$17,357	$17,208	$16,307	*	$17,484	$17,323
	WN	(27,705)	(416)	(58)	(158)	(102)	(29)	(806)	(29,274)
Female		$16,361	$18,375	*	*	$17,263	*	$17,450	$16,430
	WN	(3,774)	(121)	(17)	(18)	(31)	(7)	(102)	(4,070)

1/ Medians were computed for full-time employed citizens only. Academic year salaries have been multiplied by 11/9 to adjust to a full-year scale.
2/ Those who received the Ph.D. in 1970 or later
3/ Native-born U.S. citizens only
4/ Medians have not been calculated with fewer than 10 respondents.
5/ Number employed full-time

Source: Survey of Doctoral Scientists and Engineers, National Research Council.

II-7 Median Annual Salary by Sex and Racial/Ethnic Group for 1975 of Recent (1970-1974) Doctorate Recipients in Science and Engineering Employed in Institutions of Higher Education

Racial/Ethnic Group Differences

Among the doctoral scientists and engineers who received the Ph.D. in the decade of the 1970's and who are employed in institutions of higher education, Blacks have a higher estimated median annual salary than the members of other groups. (See footnote 1, p. 79.)

Sex Differences

When the analysis is limited to those recent doctoral recipients in the academic employment sector, the salary difference between men and women is substantially reduced but men still have a higher basic salary. This has been the traditional picture when various factors such as field, rank, years of full-time experience, type of academic institution and marital status have been held constant (e.g. Astin and Bayer, 1973, pp. 342-346; Centra, 1974, pp. 78-91; Morlock, 1973, pp. 286-292; Robinson, 1973, pp. 219-223). Other recent data show that it continues to be the case when years since degree, field and employment sector are controlled (National Research Council, 1977) and when faculty in different kinds of academic institutions are compared (American Association of University Professors, 1976).

Sex Differences within Racial/Ethnic Groups

In contrast to the situation in all other groups, Asian women in the academic sector now appear to earn more than Asian men. The apparent advantage for Asian women may be only a reflection of the use of a very small sample (N = 11) for computation of the median salary since the approximate probability is 2/3 that the true median for Asian women falls in the interval $16,480-$17,793.

Table II-8
Employment Status of Doctoral Scientists and Engineers[1/] in the U.S. Labor Force in 1973 and 1975 for Whites, Asians and Other Minorities

		Whites				Asians				Other Minorities				Total Reporting [2/]			
		MEN		WOMEN		MEN		WOMEN		MEN		WOMEN		MEN		WOMEN	
Employment Status		1973	1975	1973	1975	1973	1975	1973	1975	1973	1975	1973	1975	1973	1975	1973	1975
Employed Full-Time	WN	163,525	186,428	11,429	15,069	1,101	1,285	59	101	2,372	2,907	305	460	166,998	190,620	11,793	15,630
	V	93.9%	93.7%[3/]	71.5%	74.4%	95.8%[a]	98.9%	78.7%[b]	75.4%[b]	92.8%[a]	93.9%	88.9%[a]	87.3%[a]	93.9%	93.7%	71.9%	74.8%
Science, Eng., Postdoc.	WN	155,112	176,410	10,587	14,163	1,050	1,221	59	101	2,169	2,622	278	428	158,331	180,253	10,924	14,692
	V	89.1	88.6	66.3	70.0	92.3[a]	94.0[a]	78.7[b]	75.4[b]	84.9[a]	84.7[a]	81.0[a]	81.2[a]	89.1	88.6	66.6	70.3
Non-Science	WN	8,413	10,018	842	906	51	64	-	-	203	285	27	32	8,667	10,367	869	938
	V	4.8	5.0	5.3	4.5	4.5[a]	4.9[a]			7.9[a]	9.2[a]	7.9[a]	6.1[a]	4.9	5.1	5.3	4.5
Employed Part-Time	WN	3,454	3,740	2,293	2,401	-	10	10	21	74	56	6	36	3,528	3,806	2,309	2,458
	V	2.0	1.9	14.4	11.9		.8	13.3[b]	15.7[b]	2.9	1.8	1.7[a]	6.8[a]	2.0	1.9	14.1	11.8
Not Employed	WN	5,638	8,671	1,850	2,668	31	4	6	11	55	133	22	31	5,724	8,808	1,878	2,710
	V	3.2	4.4	11.6	13.2	2.7[a]	.3	8.0[b]	8.2[a]	2.2	4.3	6.4[a]	5.9[a]	3.2	4.3	11.5	13.0
Seeking	WN	1,484	1,380	489	485	10	4	5	6	15	30	3	5	1,509	1,414	497	496
	V	.9	.7	3.1	2.4	.9	.3	6.7[b]	4.5	.6	1.0	.9	.9	.8	.7	3.0	2.4
Not Seeking	WN	437	890	685	1,087	10	-	1	5	10	48	10	13	457	938	696	1,105
	V	.3	.4	4.3	5.4	.9		1.3[a]	3.7	.4	1.6	2.9[a]	2.5[a]	.3	.5	4.2	5.3
Retired	WN	3,717	6,401	676	1,096	11	-	-	-	30	55	9	13	3,758	6,456	685	1,109
	V	2.1	3.2	4.2	5.4	1.0				1.2	1.8	2.6[a]	2.5[a]	2.1	3.2	4.2	5.3
Other	WN	1,448[4/]	213	407[4/]	104	5[4/]	-	-	1	55[4/]	-	10[4/]	-	1,508[4/]	213	417[4/]	105
	V	.8	.1	2.5	.5	.4			.7[a]	2.2		2.9[a]		.8	.1	2.5	.5
Total	N	23,239	24,193	5,323	5,980	164	200	24	51	362	574	114	187	23,765	24,967	5,461	6,218
	WN	174,065	199,052	15,979	20,242	1,137	1,299	75	134	2,556	3,096	343	527	177,758	203,447	16,397	20,903
	V	99.9	100.1	100.0	100.0	99.9	100.0	100.0	100.0	100.1	100.0	99.9	100.0	99.9	100.0	100.0	100.1
Unknown	WN	3,259	279	422	75	14	-	-	3	66	-	29	-	3,339	279	451	78

1/ Native-born U.S. citizens only
2/ Excludes those whose group status was unknown: here 6,715 men in 1973 and 8,280 in 1975, 639 women in 1973 and 830 in 1975
3/ Subtotal may differ slightly from sum for activities because of rounding
4/ These statistics may be artificially large because the 1973 forms were processed by optical scanning equipment that did not take advantage of employment information available elsewhere on the questionnaire; consequently other statistics in the table may have a downward bias.
a Sampling error between 1 and 5 percentage points
b Sampling error between 5 and 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council.

II-8 Employment Status of Doctoral Scientists and Engineers in the U.S. Labor Force in 1973 and 1975 for Whites, Asians and Other Minorities

Racial/Ethnic Group Differences

In 1975, Whites had a higher percentage not employed than Asians, but the percentage for Whites did not differ significantly from that for "Other Minorities." Asians had the smallest proportions of retired scientists and engineers. "Other Minorities" had the highest percentage of individuals working in fields other than science or engineering in 1975.

Sex Differences

Men are more likely than women to be employed full-time, but the percentage of women in full-time employment rose from 1973 to 1975. The percentages for women for the two years are a little lower than the 81% found by Astin in 1965 (1969, p. 57) and 75% by Centra in 1973 (1974, p. 33) but the data presented here do not include women in humanities and education, fields in which women have had a higher employment rate (Centra, 1974, p. 32). Women are more likely than men to be employed part-time and to be classified among those not employed including those seeking employment, not seeking employment and retired.

Sex Differences within Racial/Ethnic Groups

The sex differences described above are clearly visible in the White group. They are minimal for "Other Minorities" where women display the higher labor force participation rates that have been described for non-white women (Carnegie, 1973b, p. 26; U.S. Department of Labor, 1975, p. 41): larger proportions employed full-time both in science and non-science positions, smaller proportions unemployed and employed part-time than White women. In both 1973 and 1975, Asian men are more likely to be employed full-time and less likely to be employed part-time than Asian women.

Table II-9
Doctoral Scientists and Engineers[1/] Desiring, but not Holding, Full-Time Employment in Science and Engineering[2/] by Sex and Racial/Ethnic Group, for 1973 and 1975 (WN = estimated number in population "desiring")

	1973		1975	
	Male	Female	Male	Female
White	WN = 2,866	1,045	2,900	986
	1.8%[3/]	9.0%	1.6%	6.5%
	(N = 21,047)[4/]	(N = 3,974)	(N = 21,732)	(N = 4,493)
Minorities	75	10	56	12
	2.3%	3.0%[a]	1.5%	2.2%[a]
	(N = 466)	(N = 114)	(N = 689)	(N = 194)
Black	29	2	26	2
	2.2%[a]	1.0%[a]	1.6%	.6%
	(N = 196)	(N = 69)	(N = 312)	(N = 118)
Asian	10	5	15	6
	.9%	7.8%[b]	1.2%	5.6%[a]
	(N = 154)	(N = 22)	(N = 192)	(N = 42)
Hispanic and Amer. Indian[5/]	36	3	15	4
	4.2%[a]	4.2%[a]	1.6%	4.2%[a]
	(N = 116)	(N = 23)	(N = 185)	(N = 34)
Total Reported	2,941	1,055	2,956	998
	1.8%	8.8%	1.6%	6.4%
	(N = 21,513)	(N = 4,088)	(N = 22,421)	(N = 4,687)
Other and Unknown	181	38	102	51
	3.2%	7.9%[a]	1.4%	8.1%[a]
	(N = 749)	(N = 159)	(N = 905)	(N = 184)

1/ Native-born U.S. citizens only.

2/ Excluded for these calculations are the retired, those who are employed part-time but are not seeking full-time employment, those holding science or engineering doctorates who have voluntarily selected employment in other fields and those who have not reported employment status or whether or not they are seeking employment.

3/ % = 100 X [WN desiring/(WN holding + WN desiring)]

4/ This is the number of white males in the sample who are holding or desire to hold full-time employment in science or engineering. The sample size "N" is provided for use in obtaining the estimated error due to sampling from Appendix D.

5/ The numbers in the American Indian and Hispanic categories were too small to permit meaningful separate tabulations.

a Sampling error between 1 and 5 percentage points
b Sampling error between 5 and 10 percentage points

Source: Survey of Doctoral Scientists and Engineers, National Research Council.

II-9 Doctoral Scientists and Engineers Desiring, but not Holding, Full-Time Employment in Science and Engineering by Sex and Racial/Ethnic Group, for 1973 and 1975

Sex Differences

Because women are more likely than men to prefer part-time work (Centra, 1974, p. 35) and to withdraw from the job market voluntarily (Centra, 1974, p. 46; Table II-7), it was decided to limit the comparison to those members of both sexes who reported that they were seeking full-time employment while unemployed or employed part-time or that they had accepted non-science employment because science or engineering employment was not available.

In both years, the estimated proportion of fully employed men was greater than the estimated proportion of women fully employed in science and engineering, although in most fields, the situation improved for women from 1973 to 1975 (Maxfield et al., 1976, pp. 7-8).

To interpret this finding, it would be important to control on marital status. Centra's study found that the majority of reasons given by women for unemployment had to do with marital status and family responsibilities, including the response, "No suitable jobs were available in the same locale as spouse's job" (1974, pp. 46-47).

Sex Differences within Racial/Ethnic Groups

The estimated proportions desiring, but not holding, full-time employment show that among Whites in both years, women are more likely than men to be in this category. The differences between men and women in the proportions in this category for the individual minority groups are not statistically significant. Even if a composite of the minority groups is considered, the difference between men and women is not statistically significant. These statistics are included for interest and should be used with great care.

CHAPTER III

Baccalaureate and Doctoral Institutions of Women and Minority Ph.D.'s

This chapter reports some of the characteristics of the undergraduate institutions and doctoral institutions of men and women Ph.D.'s and of Ph.D.'s of different racial/ethnic groups. The analysis in this chapter is limited to institutions in the United States. Table III-1 provides lists of the 25 undergraduate institutions that ranked[1] highest in number of graduates of each sex who obtained doctorates in the period 1973-1976. Comparisons are made with similar data for doctoral cohorts for 1920-1973. Table III-3 provides similar information by field. Tables III-2 and III-4 provide lists of the leading undergraduate institutions in number of graduates who obtained doctorates by racial/ethnic group and by field distribution of these groups. Comparisons are made of the distribution of institutions in the preceding tables by the Carnegie classification of doctorate-granting institutions.

Early in its work the Carnegie Commission on Higher Education recognized the need for a classification of institutions that would be useful for purposes of analysis of higher education. In 1970, the Commission developed a classification system (Carnegie Commission on Higher Education, 1973a) that has been widely used. The classification is based on statistics on federal expenditures and degrees and consists of five main categories with subcategories. Abbreviated definitions of the Carnegie categories used in this report are given on page 87.

Although the Carnegie classification of institutions of higher education was published in 1973 and is based on data for 1968-1969, 1969-1970 and 1970-1971, this timing is excellent for classification of the baccalaureate institutions of the 1973-1976 cohorts of Ph.D.'s. The Carnegie classification system is being updated

---

[1] The word "rank" where used in this report is used in the statistical sense of "order according to a statistical characteristic" (e.g., number of Ph.D.'s included in a defined group); its use is not intended to imply degree of eminence or excellence.

CARNEGIE CLASSIFICATION OF INSTITUTIONS OF HIGHER EDUCATION

(Abbreviated Definitions of Categories)

Research Universities I: The 50 leading universities by federal financial support of academic sciences in at least two of the three academic years 1968-1969, 1969-1970 and 1970-1971 provided they awarded at least 50 Ph.D.'s in 1969-1970.

Research Universities II: Included in the 100 leading institutions by federal financial support in at least two of the above three years, awarded at least 50 Ph.D.'s in 1969-1970 or among the leading 50 institutions in total number of Ph.D.'s awarded from 1960-1961 to 1969-1970.

Doctoral-Granting Universities I: Awarded 40 or more Ph.D.'s in 1969-1970 or received at least $3 million in federal financial support in 1969-1970 or 1970-1971 and granted more than 20 Ph.D.'s.

Doctoral-Granting Universities II: Awarded at least 10 Ph.D.'s in 1969-1970 or one of a few new institutions where expansion of the doctoral program is anticipated.

Comprehensive Universities and Colleges I: Institutions that offer a liberal arts program and have at least two professional or occupational programs and enrolled at least 2,000 students in 1970.

Comprehensive Universities and Colleges II: Institutions that offer a liberal arts program and at least one professional or occupational program except for private institutions that had fewer than 1,500 students or public institutions that had fewer than 1,000 students in 1970.

Liberal Arts Colleges I: Colleges that scored 5 or above on Astin's[1] selectivity index or were included among the 200 leading baccalaureate-granting institutions by number of their graduates receiving Ph.D.'s at 40 leading doctoral-granting institutions from 1920-1966.

Liberal Arts Colleges II: All the liberal arts colleges that did not meet the criteria for inclusion in the first group of liberal arts colleges.

Professional Schools and Other Specialized Institutions[2]

Medical Schools and Medical Centers: Includes only those that are listed as separate campuses in *Opening Fall Enrollment* published by the U.S. Office of Education.

Teachers Colleges

1/ Astin's selectivity index is based on National Merit Scholarship Qualifying Test Scores for all students who took the NMSQT in 1964, classified according to the college of their first choice.

2/ Within this category, medical schools and teachers colleges have been distinguished in some tables of Chapter III. Where "other" is used, as in Table III-5, this refers to all types of specialized institutions including: Theological seminaries, medical schools, health professional schools, schools of engineering and technology, schools of art, music and design, teachers colleges and other.

Source: Carnegie Commission on Higher Education, 1973a, pp. 1-5. Used with permission. Copyright © 1973 by the Carnegie Foundation for the Advancement of Teaching.

and a revised version will be published in the near future. It is understood[1] that there will be very few changes in the classification of the doctorate-granting institutions.

Table III-5 highlights the differences between the sexes and among the racial/ethnic groups in the distribution of doctorate-granting institutions for doctorate recipients in 1973-1976. The distribution of Ph.D. recipients among doctoral institutions that first granted the Ph.D. prior to 1920, from 1920-1929, 1930-1949 and 1950-1976 is explored for all Ph.D.'s, for women and for native-born U.S. citizens by racial/ethnic group in Table III-6. Data collected by the American Association of University Professors on the proportion of women on the faculty by institution are analyzed in conjunction with data on women Ph.D.'s as a percentage of total Ph.D.'s for these institutions in Table III-7. The list of all the Ph.D.-granting institutions that were above average in the proportion of Ph.D.'s granted to women given in Table III-8 is analyzed by Carnegie classification. Table III-9 provides lists of institutions that ranked highest in percentage of doctorates granted to women by field.

---

[1] Information based on telephone conversation with Dr. Margaret Gordon.

III-1 Undergraduate Institutions having the Largest Numbers of Graduates of Each Sex Who Obtained Doctorates in the Period 1973-1976

Table III-1 (see p. 91) shows the 25 undergraduate institutions that ranked highest in number of graduates of each sex who obtained doctorates in the period 1973-1976. The top 25 undergraduate institutions for women graduated 22.31% of the women who received doctorates whereas the top 25 undergraduate institutions for men accounted for only 17.35% of the men who received doctorates. Comparable data (Tidball and Kistiakowsky, 1976) for doctorates granted during the period 1920-1973 show that the top 25 undergraduate institutions for women graduated 30.33% of the women doctorates with the corresponding figure for men being 27.74% of the men who went on to receive doctorates. The large differences between the lists of undergraduate institutions for women and men are easily seen by analysis based on the Carnegie classification of the institutions:

Table III-1: Analysis I

Leading Undergraduate Institutions of Ph.D. Recipients in 1973-1976

	Undergraduate Institution	
Carnegie Category 1/	Women	Men
Research Universities I		
Public	10	15
Private	4	6
Research Universities II		
Public	1	1
Doctoral Granting Universities I		
Private		1
Comprehensive Universities and Colleges I		
Public	4	2
Liberal Arts Colleges I		
Private	6 2/	

The list of undergraduate schools for women Ph.D.'s contains seven institutions that until recently have admitted only women. Of these, six are liberal arts colleges and one is a comprehensive university. The list for men contains three

---

1/ See p. 87 for definitions.
2/ Includes Barnard College and Radcliffe College which are not classified separately in the Carnegie system.

institutions that historically were primarily for men: Harvard, Princeton and Yale, all of which fall in the category Research University I. The 11 public research universities in the list for women are all included in the list for men. Cornell University and New York University, both private research universities, are also common to both lists. There the similarity ends.

To facilitate comparison of the lists of undergraduate institutions for the 1920-1973 Ph.D.'s with those for the 1973-1976 Ph.D.'s, the ranks from the Tidball and Kistiakowsky article have been entered in parentheses on Table III-1 under the caption "T-K rank". In the list of undergraduate institutions for women the women's institutions in Table III-1 have moved down in rank, an average of 3 3/7 ranks. Bryn Mawr which ranked 20th as undergraduate institution for the 1920-1973 women Ph.D.'s has disappeared from the list of 1973-1976 Ph.D.'s. On the men's list in Table III-1, the formerly male institutions (Harvard, Princeton, and Yale) are an average 2 1/3 ranks lower than they were in the comparable list for 1920-1973 men Ph.D.'s, even though Princeton moved up in rank.

Institutions that were included in the list for 1920-1973 women Ph.D.'s but are no longer among the top 25 for 1973-1976 Ph.D.'s are: Bryn Mawr College, University of Florida, Columbia University, University of North Carolina and Northwestern University. Institutions that dropped below the top 25 for 1973-1976 men Ph.D.'s but were listed for 1920-1973 Ph.D.'s are University of Chicago, Columbia University, New York University, University of North Carolina and University of Missouri.

Table III-1

Undergraduate Institutions having the Largest Numbers of Graduates of Each Sex Who Obtained Doctorates in the Period 1973-1976

Rank	Women			Men		
	T-K 1/ Rank	Institution	Number	T-K 1/ Rank	Institution	Number
1	(5)	University of Michigan, Ann Arbor	398	(1)	University of California, Berkeley	1,381
2	(2)	University of California, Berkeley	396	(4)	University of Illinois, Urbana	1,011
3	(1)	City University of New York, Hunter College	303	(6)	University of Michigan, Ann Arbor	939
4	(14)	Cornell University	296	(8)	Massachusetts Institute of Technology	922
5	(3)	Barnard College	289	(11)	University of California, Los Angeles	907
6	(12)	University of California, Los Angeles	288	(2)	University of Wisconsin, Madison	893
7	(9)	City University of New York, Brooklyn College	286	(3)	City University of New York, City College	889
8	(6)	Wellesley College	261	(5)	Harvard University	872
9	(18)	University of Texas, Austin	257	(new)	Michigan State University	759
10	(4)	University of Wisconsin, Madison	257	(9)	Cornell University	751
11	(17)	University of Illinois, Urbana	256	(17)	Pennsylvania State University, University Park	740
12	(22)	Stanford University	240	(12)	Ohio State University, Columbus	717
13	(13)	Smith College	239	(16)	University of Texas, Austin	702
14	(10)	Radcliffe College	230	(7)	University of Minnesota, Minneapolis	695
15	(8)	University of Minnesota, Minneapolis	217	(18)	City University of New York, Brooklyn College	658
16	(11)	New York University	216	(new)	Brigham Young University	624
17	(new)	City University of New York, Queens College	209	(20)	Purdue University	607
18	(19)	Ohio State University, Columbus	201	(23)	Stanford University	598
19	(new)	Michigan State University	200	(new)	Rutgers University, New Brunswick	584
20	(15)	Vassar College	187	(15)	Yale University	550
21	(new)	Indiana University, Bloomington	185	(24)	University of Florida, Gainesville	535
22	(new)	Rutgers University, New Brunswick	180	(21)	University of Washington	517
23	(7)	University of Chicago	180	(new)	University of Utah	484
24	(new)	City University of New York, City College	174	(25)	Princeton University	474
25	(16)	Mount Holyoke College	170	(new)	Indiana University, Bloomington	458
		Number in listed institutions	6,115			18,265
		Number in all institutions	27,412 2/			105,261

1/ Ranks for institutions based on number of graduates of each sex who obtained doctorates during the period from 1920-1973 (Tidball and Kistiakowsky, 1976).

2/ Total number of women Ph.D.'s, 1973-1976

Source: Survey of Earned Doctorates, National Research Council.

III-2 Undergraduate Institutions having the Largest Numbers of Graduates Who Obtained Doctorates by Racial/Ethnic Group, 1973-1976

Table III-2 gives lists of undergraduate institutions that ranked highest in number of graduates who obtained doctorates in the period 1973-1976 for each of the six racial/ethnic groups. Except where institutions were tied for the 25th rank or where institutions had fewer than 2 graduates who obtained the doctorate degree, the lists contain 25 institutions. During the four-year period, 1973-1976, 13% of the Ph.D.'s did not provide usable responses to the question on racial/ethnic group. The ranks in the lists might vary somewhat if racial/ethnic group were known for these individuals.

There is a strong tendency for minority Ph.D.'s to have graduated from undergraduate institutions in states where their groups are concentrated. All but four of the undergraduate institutions in the list for Black doctorate recipients are institutions in the "Old South." Of the 25 institutions, 22, or 88.0%, have been historically primarily Black institutions. The 26 institutions listed for American Indians include 11 from the states of Oklahoma, Arizona, California, New Mexico and North Carolina which have the largest proportions of the American Indian population. These 12 institutions graduated 84, or 56%, of the 150 American Indians shown on the list. The 28 institutions listed for Chicanos include 22 from the states of Texas, Colorado, Arizona, New Mexico and California where large numbers of Chicanos live. The 18 undergraduate institutions shown for Puerto Ricans include 5 in Puerto Rico that account for 118, or 74.2%, of the 159 Puerto Ricans who graduated from these institutions and went on to obtain doctoral degrees. An additional 17.0%, or 27, of the Puerto Rican Ph.D.'s shown have baccalaureates from one of the 6 institutions in New York state on the list. The 25 high ranking baccalaureate institutions for Asian Ph.D.'s include 12 California institutions, 1 Hawaiian institution and 3 institutions in Washington and Oregon accounting for 48.0%, 15.4% and 7.7%, respectively, of the 714 Asian Ph.D.'s from the 25 undergraduate institutions.

There are large differences among the lists of undergraduate institutions for the different racial/ethnic groups. These differences are quantified in the following analysis by Carnegie categories.

Table III-2: Analysis I

Leading Undergraduate Institutions of Ph.D. Recipients in 1973-1976

	Vertical % of Listed Undergraduate Institutions					
Carnegie Category	White	Black	Amer. Indian	Chicano	Puerto Rican	Asian
Research Universities I						
Public	56.0%	-	38.5%	21.4%	22.2%	44.0%
Private	24.0	-	3.8	7.1	11.1	20.0
Research Universities II						
Public	4.0	4.0%	19.2	3.6	-	12.0
Private	-	-	3.8	-	5.6	-
Doctoral-Granting Universities I and II						
Public	-	-	7.7	17.9	-	-
Private	4.0	4.0	-	-	5.6	-
Comprehensive Universities and Colleges I						
Public	12.0	64.0	19.2	42.9	27.8	20.0
Private	-	8.0	-	3.6	16.7	4.0
Comprehensive Universities and Colleges II						
Public	-	4.0	7.7	-	-	-
Private	-	-	-	3.6	-	-
Liberal Arts Colleges I						
Private	-	12.0	-	-	5.6	-
Medical Schools and Medical Centers	-	-	-	-	5.6	-
Teachers Colleges	-	4.0	-	-	-	-
Number of Institutions	25	25	26	28	18	25

Four-fifths of the listed leading baccalaureate institutions for Whites are Research Universities I; the comparable number for Asians is 64%. On the other hand, no institutions in this category are included in the list for Blacks. The list of institutions for American Indians contains more Research Universities II than are shown in the other lists. Comprehensive Universities and Colleges I represent a large proportion on the lists of undergraduate institutions for Black, Chicano and Puerto Rican Ph.D.'s - 72.0%, 46.5% and 44.5%, respectively.

Table III-2

Undergraduate Institutions having the Largest Numbers of Graduates Who Obtained Doctorates by Racial/Ethnic Group, 1973-1976

Rank	White All Citizens		Black All Citizens	
	Institution	Number	Institution	Number
1	University of California, Berkeley	1,350	Howard University	138
2	University of Michigan, Ann Arbor	1,125	Florida A&M University, Tallahassee	102
3	University of Illinois, Urbana	1,053	Southern University, Baton Rouge	90
4	University of Wisconsin, Madison	1,006	Tuskegee Institute	76
5	University of California, Los Angeles	941	Wayne State University	71
6	Cornell University	855	Tennessee State University, Nashville	68
7	City University of New York, City College	846	Morehouse College	67
8	Michigan State University	801	Hampton Institute	62
9	University of Texas, Austin	784	Alabama State University, Montgomery	60
10	University of Minnesota, Minneapolis	783	Virginia State College, Petersburg	54
11	Penn State University, University Park	777	Morgan State University, Baltimore	53
12	City University of New York, Brooklyn College	772	North Carolina Central University, Durham	53
13	Massachusetts Institute of Technology	757	North Carolina A&T State University, Greensboro	52
14	Ohio State University, Columbus	751	Prairie View A&M University, Texas	46
15	Harvard University	724	Fisk University	44
16	Stanford University	701	Alcorn State University, Mississippi	43
17	Rutgers University, New Brunswick	658	Central State University, Wilberforce, Ohio	41
18	Purdue University, West Lafayette	620	University of Arkansas, Pine Bluff	40
19	University of Florida	586	Jackson State University, Mississippi	38
20	Brigham Young University	576	West Virginia State College	38
21	University of Washington	569	California State University, Los Angeles	37
22	Indiana University, Bloomington	539	South Carolina State College	36
23	New York University	486	Spelman College	35
24	City University of New York, Queens College	485	D.C. Teachers College	32
25	Yale University	479	Lincoln University, Jefferson City, Missouri	31

Source: Survey of Earned Doctorates, National Research Council.

Table III-2 continued.

Rank	American Indian All Citizens		Chicano All Citizens	
	Institution	Number	Institution	Number
1	Oklahoma State University, Stillwater	18	University of Texas, Austin	32
2	University of Oklahoma	15	University of New Mexico, Albuquerque	31
3	University of California, Berkeley	11	University of California, Los Angeles	31
4	Northeastern Oklahoma State University	7	California State University, Los Angeles	29
5	University of Texas, Austin	6	University of Texas, El Paso	25
6	Arizona State University	6	University of Arizona	22
7	University of Michigan, Ann Arbor	5	Texas A&I University, Kingsville	21
8	University of Minnesota, Minneapolis	5	University of Florida	20
9	University of Missouri, Columbia	5	University of California, Berkeley	17
10	Southeastern Oklahoma State University	5	San Jose State University	16
11	Texas A&M University	5	San Diego State University	15
12	California State University, Fresno	5	New Mexico Highlands University	13
13	Stanford University	5	University of Miami	12
14	Penn State University, University Park	4	New Mexico State University, Las Cruces	12
15	Kansas State College, Pittsburg	4	Arizona State University	11
16	University of Maryland, College Park	4	California State University, Long Beach	11
17	Pembroke State University, North Carolina	4	Pan American University, Texas	10
18	University of Florida	4	St. Mary's University, San Antonio	10
19	Auburn University, Auburn, Alabama	4	Adams State College, Alamosa, Colorado	10
20	East Texas State University, Commerce	4	University of California, Santa Barbara	10
21	Rice University	4	University of Southern California	9
22	University of Colorado, Boulder	4	University of Illinois, Urbana	8
23	University of Oregon	4	University of South Florida, Tampa	8
24	Oregon State University	4	University of North Colorado	8
25	California State University, Long Beach	4	Louisiana State University, Baton Rouge	7
26	San Francisco State University	4	University of Albuquerque	7
27			University of Puerto Rico, Rio Piedras	7
28			San Francisco State University	7

Source: Survey of Earned Doctorates, National Research Council.

Rank	Puerto Rican All Citizens		Asian All Citizens	
	Institution	Number	Institution	Number
1	University of Puerto Rico, San Juan	93	University of California, Berkeley	142
2	University of Puerto Rico, Mayaguez	14	University of Hawaii	110
3	City University of New York, City College	10	University of California, Los Angeles	58
4	City University of New York, Hunter College	6	Massachusetts Institute of Technology	50
5	Inter American University of Puerto Rico	5	University of Illinois, Urbana	37
6	City University of New York, Brooklyn College	4	University of Wisconsin, Madison	27
7	College of the Sacred Heart, Puerto Rico	4	University of Michigan	24
8	New York University	3	University of Washington	24
9	Boston University	2	University of California, Davis	22
10	Massachusetts Institute of Technology	2	Stanford University	21
11	Long Island University	2	Oregon State University	19
12	State University of New York, Oswego	2	California State University, Los Angeles	17
13	University of Illinois, Urbana	2	Cornell University	16
14	University of Maryland, College Park	2	Indiana University, Bloomington	15
15	Georgetown University	2	University of Minnesota, Minneapolis	14
16	University of Florida	2	California Institute of Technology	14
17	University of California, Los Angeles	2	San Franciso State University	14
18	Catholic University of Puerto Rico	2	Purdue University	13
19	(63 institutions with 1 Ph.D.)		San Jose State University	13
20			University of Oregon, Eugene	12
21			San Diego State University	11
22			University of Southern California, Los Angeles	11
23			Ohio State University, Columbus	10
24			California State University, Fresno	10
25			University of San Francisco	10

Source: Survey of Earned Doctorates, National Research Council.

III-3 Undergraduate Institutions having the Largest Numbers of Graduates Who Obtained Doctorates by Sex and Field, 1973-1976

Table III-3 provides lists of undergraduate institutions that ranked highest in number of graduates who were granted doctorates in the years 1973-1976 by sex for each of five fields. The top 25 undergraduate institutions for women Ph.D.'s in each field graduated the following proportions of the total for all institutions: physical sciences and engineering, 21.9%; life sciences, 21.6%; social sciences, 30.7%; arts and humanities, 27.7%; and education, 18.5%. Comparable data for the top 25 undergraduate institutions for men Ph.D.'s are: physical sciences and engineering, 21.0%; life sciences, 20.7%; social sciences, 20.7%; arts and humanities, 21.3%; and education, 14.9%. In the social sciences, arts and humanities, and education, the leading undergraduate institutions for women are responsible for higher proportions of the women Ph.D.'s than the proportions of men Ph.D.'s who came from the leading undergraduate institutions for men.

The large differences between the undergraduate institutions for women and men that were found in Table III-1 naturally persist in the top institutions by field. The differences are displayed in Table III-3: Analysis I. For all fields except education, there is a higher proportion of Research Universities I among the leading undergraduate institutions of Ph.D. recipients for men than for women. Public Comprehensive Universities and Colleges I constitute high proportions of the leading undergraduate institutions for male Ph.D.'s in education and the social sciences when compared with the other fields. For women Ph.D.'s in all fields except education, the private Liberal Arts Colleges I represent over 20% of their leading undergraduate institutions. Oberlin College, the 11th ranking undergraduate institution for male Ph.D.'s in the arts and humanities is the only liberal arts college on the five lists for men.

There have been extensive changes between the lists of leading undergraduate institutions by field for the 1920-1973 Ph.D.'s (Tidball and Kistiakowsky, 1976) and those of Table III-3. For example, in physical sciences and engineering the average rank of the women's institutions in Table III-3 has increased by nine when compared

Table III-3: Analysis I

Leading Undergraduate Institutions of Ph.D. Recipients in 1973-1976 by Sex and Field

Vertical % of Listed Undergraduate Institutions

Carnegie Category of Institution	Women					Men				
	Phys. Sci.	Life Sci.	Social Sci.	Arts & Human.	Educ.	Phys. Sci.	Life Sci.	Social Sci.	Arts & Human.	Educ.
Research Universities I										
Public	38.5%	52%	40%	32%	48%	48%	68%	44%	36%	36%
Private	23.1	12	24	20	8	24	8	28	32	-
Research Universities II										
Public	-	4	-	4	20	8	20	4	-	12
Private	3.8	-	-	-	4	8	-	-	-	4
Doctoral Granting Universities I and II										
Public	-	-	-	-	8	-	-	-	-	20
Private	-	-	-	-	-	8	-	4	20	4
Comprehensive Universities and Colleges I										
Public	11.5	8	16	12	12	4	4	20	8	24
Liberal Arts Colleges I										
Private [1/]	23.1	24	20	32	-	-	-	-	4	-
Number of Institutions	26	25	25	25	25	25	25	25	25	25

[1/] Barnard College and Radcliffe College have been included in this category although not listed in the Carnegie Commission's Classification System.

with the average rank of women's institutions in 1920-1973 (Tidball and Kistiakowsky, 1976). Smith College and Goucher College, which were ranked thirteenth and twentieth for the 1920-1973 female Ph.D.'s in physical sciences and engineering, are not included in the list of 25 leading undergraduate institutions for the 1973-1976 cohorts. The changing role of the women's liberal arts colleges as leading undergraduate institutions for women Ph.D.'s can be seen clearly by comparing the five leading institutions in each of the fields for the 1920-1973 cohorts of women with those for the 1973-1976 cohorts. The lists for the 1920-1973 Ph.D.'s for physical sciences and engineering, life sciences, social sciences and arts and humanities contain four, two, two and five women's colleges, respectively, whereas for the 1973-1976 Ph.D.'s the comparable numbers are zero, one, one and three. The Liberal Arts Colleges I do not appear among the leading undergraduate institutions for women Ph.D.'s for education for either the 1920-1973 or the 1973-1976 cohorts of women Ph.D.'s. In education, however, Hunter College, a Comprehensive University I, leads both lists.

For men, the leading undergraduate institution for 1973-1976 Ph.D.'s in education is Brigham Young University, in the private Doctoral-Granting Universities I category; whereas the leading institution for each of the other fields is a Research University I.

Table III-3

Undergraduate Institutions having the Largest Numbers of Graduates Who Obtained Doctorates by Sex and Field, 1973-1976

Women (a)

Rank	Physical Sciences and Engineering		Life Sciences	
	Institution	Number	Institution	Number
1	University of Michigan	22	Cornell University	68
2	University of California, Berkeley	21	University of California, Berkeley	62
3	Massachusetts Institute of Technology	20	University of Michigan	39
4	Cornell University	20	University of Texas, Austin	39
5	University of Illinois, Urbana	20	Barnard College, Columbia University	38
6	City University of New York, City College	17	University of Illinois, Urbana	38
7	University of Texas, Austin	17	University of Wisconsin, Madison	38
8	Bryn Mawr College	16	University of California, Los Angeles	35
9	Radcliffe College	15	University of California, Davis	31
10	Stanford University	15	Stanford University	31
11	Mount Holyoke College	14	Michigan State University	30
12	Rutgers University, New Brunswick	14	Wellesley College	28
13	Rice University	14	Mount Holyoke College	27
14	University of California, Los Angeles	14	City University of New York, Hunter College	27
15	City University of New York, Hunter College	13	Vassar College	27
16	Barnard College, Columbia University	13	University of Washington	26
17	University of Rochester	13	City University of New York, Brooklyn College	25
18	University of Wisconsin, Madison	13	University of Colorado	25
19	Pennsylvania State University, University Park	12	Smith College	24
20	University of Pennsylvania	12	University of Minnesota	24
21	Wellesley College	11	Pennsylvania State University	23
22	City University of New York, Brooklyn College	11	Ohio State University	23
23	Vassar College	11	University of Chicago	23
24	University of Pittsburgh	11	Bryn Mawr College	22
25	Northwestern University	11	Indiana University	22
26	Michigan State University	11		
	Number in ranked institutions	381		795
	Number in all institutions	1,738		3,675

Source: Survey of Earned Doctorates, National Research Council.

Table III-3 continued.

Women (b)

Rank	Social Sciences		Arts and Humanities	
	Institution	Number	Institution	Number
1	University of California, Berkeley	133	Smith College	122
2	University of Michigan, Ann Arbor	120	Barnard College, Columbia University	112
3	City University of New York, Brooklyn College	93	University of Michigan, Ann Arbor	108
4	Barnard College, Columbia University	93	Wellesley College	104
5	University of California, Los Angeles	91	University of California, Berkeley	104
6	Radcliffe College	87	Radcliffe College	92
7	Cornell University	87	Bryn Mawr College	82
8	Wellesley College	82	Stanford University	80
9	City University of New York, Hunter College	81	University of California, Los Angeles	76
10	New York University	81	City University of New York, Hunter College	74
11	University of Minnesota, Minneapolis	75	Vassar College	73
12	Stanford University	73	Cornell University	71
13	University of Wisconsin, Madison	72	City University of New York, Queens College	66
14	City University of New York, City College	71	Mount Holyoke College	64
15	University of Illinois, Urbana	65	University of Illinois, Urbana	58
16	City University of New York, Queens College	63	City University of New York, Brooklyn College	56
17	University of Texas, Austin	60	University of Chicago	55
18	University of Chicago	59	University of Texas, Austin	54
19	Michigan State University	58	University of Wisconsin, Madison	53
20	Vassar College	55	New York University	52
21	Rutgers University, New Brunswick	53	Rutgers University, New Brunswick	50
22	Smith College	52	Oberlin College	50
23	University of Pennsylvania	49	Indiana University, Bloomington	50
24	Northwestern University	49	University of Pennsylvania	49
25	University of Colorado, Boulder	48	University of Washington	44
	Number in ranked institutions	1,850		1,799
	Number in all institutions	6,023		6,483

Table III-3 continued.

Women (c)

Rank	Education	
	Institution	Number
1	City University of New York, Hunter College	100
2	University of Michigan, Ann Arbor	94
3	City University of New York, Brooklyn College	90
4	Ohio State University	88
5	University of Texas, Austin	76
6	University of Wisconsin, Madison	75
7	Wayne State University	72
8	Florida State University	66
9	University of Illinois, Urbana	65
10	Boston University	64
11	New York University	[62
12	University of Pittsburgh	[62
13	University of California, Los Angeles	61
14	University of Minnesota, Minneapolis	59
15	University of California, Berkeley	58
16	University of Florida, Gainesville	57
17	Indiana University, Bloomington	56
18	Michigan State University	55
19	City University of New York, Queens College	54
20	Pennsylvania State University	53
21	University of Alabama	50
22	Temple University	44
23	Northwestern University	42
24	University of Kansas	[41
25	Arizona State University	[41
	Number in ranked institutions	1,585
	Number in all institutions	8,552

Table III-3 continued.

Men (a)

Rank	Physical Sciences and Engineering		Life Sciences	
	Institution	Number	Institution	Number
1	Massachusetts Institute of Technology	702	University of California, Berkeley	243
2	University of California, Berkeley	499	Cornell University	194
3	University of Illinois, Urbana	344	University of Illinois, Urbana	191
4	University of Michigan	308	University of Wisconsin, Madison	178
5	Cornell University	289	Pennsylvania State University	170
6	City University of New York, City College	288	Michigan State University	162
7	University of Wisconsin, Madison	283	Ohio State University	160
8	Purdue University	276	University of California, Davis	159
9	Rensselaer Polytechnic Institute	272	Iowa State University	153
10	University of California, Los Angeles	258	University of Minnesota, Minneapolis	152
11	University of Texas, Austin	233	Purdue University	142
12	Pennsylvania State University	232	Colorado State University	138
13	Harvard University	204	Rutgers University	137
14	Case Western Reserve University	196	Oklahoma State University	123
15	Calif. Institute of Technology	195	University of Michigan	119
16	Georgia Institute of Technology	191	Texas A&M University	109
17	University of Minnesota, Minneapolis	181	University of California, Los Angeles	107
18	Carnegie-Mellon University	177	University of Florida	103
19	Iowa State University	173	University of Missouri	100
20	Princeton University	172	City University of New York, City College	98
21	Michigan State University	169	Harvard University	93
22	University of Washington	167	University of Nebraska	92
23	Rutgers University	158	University of Texas, Austin	90
24	Rice University	157	Kansas State University	86
25	Polytechnic Institute of New York, Brooklyn	155	University of Washington	82
	Number in ranked institutions	6,279		3,381
	Number in all institutions	29,867		16,313

Table III-3 continued.

Men (b)

Rank	Social Sciences		Arts and Humanities	
	Institution	Number	Institution	Number
1	University of California Berkeley	312	Harvard University	247
2	Harvard University	250	Yale University	196
3	University of California, Los Angeles	237	University of California, Berkeley	182
4	City University of New York, City College	234	Stanford University	162
5	University of Michigan	215	University of California, Los Angeles	160
6	CUNY, Brooklyn College	206	University of Michigan	140
7	University of Illinois, Urbana	183	Princeton University	138
8	University of Wisconsin, Madison	162	City University of New York, City College	124
9	Yale University	160	Fordham University	124
10	Stanford University	158	Columbia University	121
11	University of Texas, Austin	148	Oberlin College	117
12	Brigham Young University	147	University of Wisconsin, Madison	109
13	Michigan State University	143	University of Texas, Austin	104
14	City University of New York, Queens	134	City University of New York, Brooklyn	102
15	Cornell University	133	University of Illinois, Urbana	101
16	University of Minnesota, Minneapolis	131	Dartmouth College	91
17	University of Washington	126	Notre Dame University	90
18	Rutgers University	120	University of Chicago	89
19	Ohio State University	119	University of North Carolina, Chapel Hill	88
20	Indiana University	110	Northwestern University	87
21	San Diego State University	100	Brigham Young University	86
22	San Francisco State University	100	University of Minnesota, Minneapolis	84
23	New York University	99	Michigan State University	83
24	Princeton University	98	Boston College	82
25	University of Chicago	97	Columbia College, Columbia University	77
	Number in ranked institutions	3,922		2,984
	Number in all institutions	18,973		13,977

Table III-3 continued.

Men (c)

Rank	Education	
	Institution	Number
1	Brigham Young	189
2	Ohio State University	170
3	Michigan State University	161
4	Pennsylvania State University	143
5	University of Illinois, Urbana	143
6	University of Florida	141
7	Southern Illinois University	138
8	Wayne State University	138
9	University of Wisconsin, Madison	126
10	Florida State University	126
11	Indiana State University	125
12	City University of New York, Brooklyn	123
13	Western Michigan University	123
14	University of Northern Iowa	117
15	University of Michigan	116
16	City University of New York, City College	111
17	University of Northern Colorado	111
18	University of California, Los Angeles	109
19	University of Utah	107
20	California State University, Long Beach	105
21	Ball State University	103
22	Boston University	101
23	California State University, Los Angeles	101
24	San Jose State University	101
25	Temple University	100
	Number in ranked institutions	3,128
	Number in all institutions	21,011

III-4 Undergraduate Institutions having the Largest Numbers of Graduates Who Obtained Doctorates by Field and Racial/Ethnic Group, 1973-1976

Table III-4 lists the undergraduate institutions that ranked highest in number of graduates who obtained doctorates in the period 1973-1976 for each of the six racial/ethnic groups by field. The same patterns that stood out in Table III-2 prevail when the data are further classified by field. Here, as in Table III-2, the ranks in the lists are subject to some error due to non-response to the racial/ethnic question.

There is a strong tendency for minority groups in each field to have graduated from undergraduate institutions in states where the population of minority groups is concentrated. For Blacks, for each field, over half of the undergraduate institutions are in the "Old South" and are institutions that have been historically predominantly Black institutions. This pattern is strongest in the field of education where only two predominantly White institutions appear. The largest numbers of predominantly White institutions are found on the lists for physical sciences and engineering and the social sciences.

Except for education, each list of undergraduate institutions for American Indian Ph.D.'s shows 11 or fewer institutions with 2 or more graduates who were awarded doctorates in 1973-1976. In these four lists about half of the institutions are from the states of Oklahoma, Arizona, California, New Mexico and North Carolina, states that are high in number of American Indians.

Well over half of the leading undergraduate institutions for Chicano Ph.D.'s, for all fields except physical sciences and engineering, are from the states of Texas, Colorado, Arizona, New Mexico and California which have the largest proportions of the Chicano population.

For each field, there are at most five undergraduate institutions that graduated two or more Puerto Rican baccalaureates who later became Ph.D.'s during 1973-1976 and all the institutions are in Puerto Rico or New York.

The lists of undergraduate institutions for the Asian Ph.D.'s are very similar to those for the Whites, containing large numbers of institutions in the Research Universities I category. The lists for Asians all rank the University of Hawaii in the top six institutions and show more West Coast institutions than are shown in the lists for the Whites.

Table III-4

Undergraduate Institutions having the Largest Numbers of Graduates Who Obtained Doctorates by Field and Racial/Ethnic Group, 1973-1976

Physical Sciences and Engineering (a)

Rank	White All Citizens		Black All Citizens	
	Institution	Number	Institution	Number
1	Massachusetts Institute of Technology	564	Howard University	16
2	University of California, Berkeley	353	Morehouse College	11
3	University of Illinois, Urbana	295	Morgan State College	8
4	University of Michigan	274	Purdue University	7
5	City University of New York, City College	248	Hampton Institute	6
6	University of Wisconsin, Madison	245	North Carolina Agricultural and Technical State University	6
7	Rensselaer Polytechnic Institute	244	Tennessee State University	5
8	Cornell University	240	Alabama Agricultural and Mechanical University	5
9	Purdue University	239	Alcorn State University	5
10	University of California, Los Angeles	213	Massachusetts Institute of Technology	4
11	Pennsylvania State University	207	Cornell University	4
12	University of Texas, Austin	202	University of Kansas	4
13	Case Western Reserve University	187	Virginia Union University	4
14	Harvard University	173	Alabama State University	4
15	Georgia Institute of Technology	168	Tuskegee Institute	4
16	Iowa State University	157	Southern University and Agricultural and Mechanical College	4
17	Michigan State University	156	New York University	3
18	University of Minnesota, Minneapolis	156	Rensselaer Polytechnic Institute	3
19	Carnegie-Mellon University	154	Princeton University	3
20	California Institute of Technology	153	Lincoln University, Pennsylvania	3
21	Rutgers University	148	University of Pittsburgh	3
22	University of Washington	148	Wayne State University	3
23	Rice University	147	University of Wisconsin, Madison	3
24	Princeton University	141	Prairie View Agricultural and Mechanical University	3
25	Stanford University	132	Texas Southern University	3
26			California State University, Los Angeles	3
27			University of California, Los Angeles	3

Source: Survey of Earned Doctorates, National Research Council.

Table III-4 continued.

Physical Sciences and Engineering (b)

Rank	American Indian All Citizens		Chicano All Citizens	
	Institution	Number	Institution	Number
1	University of California, Berkeley	5	University of Texas, El Paso	8
2	University of Oklahoma	4	University of Arizona	5
3	University of Missouri	2	University of California, Los Angeles	5
4	Auburn University, Auburn	2	University of Florida	4
5	Rice University	2	University of Texas, Austin	4
6	University of Texas, Austin	2	University of California, Berkeley	4
7	California Institute of Technology	2	Louisiana State University and Agricultural and Mechanical College	3
8	California State Polytechnic University, Pomona	2	Trinity University	3
9	(52 institutions with 1 Ph.D.)		New Mexico State University	3
10			University of California, Davis	3
11			Iona College	2
12			New York University	2
13			State University of New York, Buffalo	2
14			Princeton University	2
15			University of Missouri, Rolla	2
16			Georgia Institute of Technology	2
17			University of South Florida, Tampa	2
18			University of Miami, Florida	2
19			Tulane University of Louisiana	2
20			University of Houston	2
21			Texas A & M University	2
22			University of Puerto Rico	2
23			(52 institutions with 1 Ph.D.)	

Table III-4 continued.

Physical Sciences and Engineering (c)

Rank	Puerto Rican All Citizens		Asian All Citizens	
	Institution	Number	Institution	Number
1	University of Puerto Rico, Rio Piedras	14	University of California, Berkeley	75
2	University of Puerto Rico, Mayaguez	10	Massachusetts Institute of Technology	46
3	City University of New York, City College	2	University of California, Los Angeles	25
4	(10 institutions with 1 Ph.D.)		University of Wisconsin, Madison	19
5			University of Illinois, Urbana	18
6			University of Hawaii	17
7			Oregon State University	16
8			California Institute of Technology	14
9			Cornell University	11
10			University of Michigan	11
11			University of Minnesota	11
12			Polytechnic Institute of New York	9
13			Purdue University	9
14			University of California, Davis	9
15			Georgia Institute of Technology	8
16			University of Washington	7
17			University of Pennsylvania	6
18			Ohio State University	6
19			University of Kansas	6
20			North Carolina State University	6
21			Utah State University	6
22			San Francisco State University	6
23			University of Oregon	5
24			University of Southern California	5
25			Columbia University	4
26			Rensselaer Polytechnic Institute	4
27			Lehigh University	4
28			Case Western Reserve University	4
29			University of Missouri	4
30			Texas A & M University	4

Table III-4 continued.

Life Sciences (a)

Rank	White All Citizens		Black All Citizens	
	Institution	Number	Institution	Number
1	University of California, Berkeley	223	Howard University	20
2	Cornell University	214	Tuskegee Institute	19
3	University of Wisconsin, Madison	201	Morehouse College	9
4	University of Illinois, Urbana	189	Southern University	9
5	Pennsylvania State University	174	North Carolina Agricultural and Technical State University	7
6	Michigan State University	167	Alcorn State University	7
7	University of California, Davis	155	Prairie View Agricultural and Mechanical University	7
8	Purdue University	149	Alabama Agricultural and Mechanical University	6
9	Ohio State University	148	University of Arkansas, Pine Bluff	6
10	University of Minnesota	145	Virginia State College	5
11	Iowa State University	144	Knoxville College	5
12	Rutgers University	138	Tennessee State University	5
13	University of Michigan	138	Xavier University of Louisiana	5
14	Colorado State University	128	Hampton Institute	5
15	Oklahoma State University	116	Central State University	4
16	University of California, Los Angeles	113	Morgan State College	4
17	University of Texas, Austin	105	North Carolina Central University	4
18	Texas A & M University	99	Bethune-Cookman College	4
19	University of Florida	98	Florida Agricultural and Mechanical University	4
20	University of Missouri	91	Alabama State University	4
21	University of Washington	91	University of California, Davis	4
22	University of Nebraska	89	City University of New York, City College	3
23	City University of New York, City College	84	Purdue University	3
24	City University of New York, Brooklyn College	83	Michigan State University	3
25	Kansas State University	83	Norfolk State University	3
26			West Virginia State College	3
27			Fisk University	3
28			Talladega College	3
29			Tougaloo College	3
30			Texas Southern University	3
31			San Francisco State University	3

Table III-4 continued.

Life Sciences (b)

Rank	American Indian All Citizens		Chicano All Citizens	
	Institution	Number	Institution	Number
1	Oklahoma State University	5	University of Florida	7
2	University of Missouri, Columbia	2	University of New Mexico	7
3	University of Maryland	2	University of Texas, Austin	6
4	Virginia Polytechnic Institute and State University	2	University of Texas, El Paso	3
5	Henderson State University, Arkansas	2	New Mexico State University	3
6	Arizona State University	2	University of Arizona	3
7	University of California, Berkeley	2	San Jose State University	3
8	Stanford University	2	Louisiana State University and Agricultural and Mechanical College	2
9	(47 institutions with 1 Ph.D.)		Southwest Texas State University	2
10			California Polytechnic University	2
11			San Diego State University	2
12			University of California, Los Angeles	2
13			(57 institutions with 1 Ph.D.)	

Table III-4 continued.

Life Sciences (c)

Rank	Puerto Rican All Citizens		Asian All Citizens	
	Institution	Number	Institution	Number
1	University of Puerto Rico, Rio Piedras	14	University of California, Berkeley	38
2	City University of New York, City College	3	University of Hawaii	31
3	University of Puerto Rico, Mayaguez	2	University of California, Los Angeles	15
4	(9 institutions with 1 Ph.D.)		University of California, Davis	11
5			University of Illinois, Urbana	8
6			Stanford University	8
7			Indiana University	6
8			University of Wisconsin, Madison	6
9			University of Michigan	5
10			University of Washington	5
11			California State University, Fresno	5
12			Cornell University	4
13			University of Oregon	4
14			California State University, Long Beach	4
15			San Francisco State University	4
16			Mount Holyoke	3
17			City University of New York, Hunter College	3
18			Barnard College, Columbia University	3
19			State University of New York, Buffalo	3
20			North Carolina State University	3
21			University of Georgia	3
22			University of Utah	3
23			California Polytechnic State University, San Luis Obispo	3
24			California State University, Los Angeles	3
25			San Jose State University	3
26			Loyola Marymount University	3
27			University of San Francisco	3

Table III-4 continued.

Social Sciences (a)

Rank	White All Citizens		Black All Citizens	
	Institution	Number	Institution	Number
1	University of California, Berkeley	355	Howard University	24
2	University of Michigan	287	California State University, Los Angeles	14
3	University of California, Los Angeles	267	Morehouse College	12
4	City University of New York, City College	256	University of Michigan	11
5	City University of New York, Brooklyn	241	North Carolina A&T State University, Greensboro	11
6	Harvard University	222	Tuskegee Institute	9
7	University of Illinois, Urbana	212	University of California, Berkeley	8
8	University of Wisconsin, Madison	209	Michigan State University, East Lansing	7
9	Stanford University	195	Morgan State College	7
10	Cornell University	184	Florida A&M University	7
11	University of Minnesota, Minneapolis	184	Tennessee State University, Nashville	7
12	University of Texas, Austin	175	City University of New York, City College	6
13	City University of New York, Queens	168	Temple University	6
14	Michigan State University	167	Spelman College, Atlanta	6
15	Rutgers University	148	Fisk University, Nashville	6
16	University of Washington	145	Southern University, Baton Rouge	6
17	New York University	140	University of California, Los Angeles	6
18	Yale University	138	Boston University	5
19	Brigham Young University	132	City University of New York, Hunter College	5
20	Ohio State University	129	University of Pittsburgh	5
21	Indiana University	129	Central State University	5
22	University of Chicago	128	Ohio State University	5
23	University of Pennsylvania	124	University of Kansas	5
24	University of Maryland	122	Hampton Institute	5
25	University of Colorado	122	Clark College	5
26			Alabama State University	5
27			San Francisco State University	5

Table III-4 continued.

Social Sciences (b)

Rank	American Indian All Citizens		Chicano All Citizens	
	Institution	Number	Institution	Number
1	University of Oklahoma, Norman	5	California State University, Los Angeles	8
2	University of Colorado	3	University of California, Berkeley	5
3	California State University, Fresno	3	Texas A&I University, Kingsville	4
4	Southern Illinois University, Carbondale	2	University of Texas, Austin	4
5	Auburn University, Auburn	2	University of Arizona	4
6	Oklahoma State University, Stillwater	2	University of California, Los Angeles	4
7	San Francisco State University	2	University of Puerto Rico, Rio Piedras	4
8	University of California, Berkeley	2	University of Florida	3
9	University of California, Los Angeles	2	St. Mary's University	3
10	(73 institutions with 1 Ph.D.)		University of New Mexico	3
11			California State University, Long Beach	3
12			San Francisco State University	3
13			University of California, Santa Barbara	3
14			University of Illinois, Urbana	2
15			Florida State University	2
16			University of South Florida	2
17			Louisiana State University	2
18			New Mexico Highlands University	2
19			Arizona State University	2
20			Brigham Young University	2
21			California State University, Fullerton	2
22			San Diego State University	2
23			San Jose State University	2
24			University of California, Riverside	2
25			Claremont Men's College	2

Table III-4 continued.

Social Sciences (c)

Rank	Puerto Rican All Citizens		Asian All Citizens	
	Institution	Number	Institution	Number
1	University of Puerto Rico, Rio Piedras	21	University of Hawaii	24
2	City University of New York, City College	2	University of California, Berkeley	12
3	Inter-American University of Puerto Rico	2	University of California, Los Angeles	9
4	College of the Sacred Heart, Puerto Rico	2	California State University, Los Angeles	8
5	(23 institutions with 1 Ph.D.)		University of Illinois	7
6			Stanford University	7
7			University of Washington	5
8			University of Michigan	3
9			University of Oregon	3
10			San Diego State University	3
11			San Francisco State University	3
12			San Jose State University	3
13			Claremont Men's College	3
14			University of Santa Clara	3
15			University of Southern California	3
16			Williams College	2
17			Columbia University	2
18			Lafayette College	2
19			Indiana University	2
20			Wayne State University	2
21			George Washington University	2
22			West Virginia University	2
23			University of Georgia	2
24			George Peabody College for Teachers	2
25			University of Colorado	2
26			Brigham Young University	2
27			Lewis & Clark College	2
28			California State University, Long Beach	2
29			University of California, Davis	2
30			Occidental College	2
31			University of San Francisco	2

Table III-4 continued.

Arts & Humanities (a)

Rank	White All Citizens		Black All Citizens	
	Institution	Number	Institution	Number
1	University of California, Berkeley	234	Howard University	22
2	Stanford University	214	North Carolina Central University	10
3	University of Michigan	206	Xavier University of Louisiana	9
4	Harvard University	198	Morgan State College	7
5	University of California, Los Angeles	188	Morehouse College	7
6	Yale University	177	Spelman College	7
7	University of Wisconsin, Madison	142	Hampton Institute	6
8	Oberlin College	132	Florida A&M University	6
9	University of Illinois, Urbana	132	Central State University	5
10	City University of New York, Brooklyn	128	Michigan State University	5
11	Cornell University	128	University of Arkansas, Pine Bluff	5
12	University of Texas, Austin	127	Southern University and A&M College, Baton Rouge	5
13	Princeton University	125	Harvard University	4
14	City University of New York, City College	122	City University of New York, Hunter College	4
15	Fordham University	119	Columbia University	4
16	City University of New York, Queens	116	University of Illinois, Urbana	4
17	University of Chicago	115	Wayne State University	4
18	Columbia University	114	University of Kansas	4
19	University of Minnesota, Minneapolis	110	Fisk University	4
20	Smith College	108	Alabama State University	4
21	Rutgers University	108	Talladega College	4
22	Wellesley College	101	Jackson State University	4
23	University of Rochester	101	Prairie View A&M University	4
24	University of Pennsylvania	101	University of Pittsburgh	3
25	Duke University	99	University of Chicago	3
26			Roosevelt University	3
27			Benedictine College	3
28			Virginia Union College	3
29			Bennett College	3
30			North Carolina A&T State University	3
31			Paine College	3
32			Lane College	3
33			University of California, Berkeley	3

Table III-4 continued.

Arts & Humanities (b)

Rank	American Indian All Citizens		Chicano All Citizens	
	Institution	Number	Institution	Number
1	University of Michigan	4	University of California, Los Angeles	10
2	East Texas State University	3	University of New Mexico	9
3	Pennsylvania State University, University Park	2	University of Texas, Austin	8
4	University of Chicago	2	University of Miami	6
5	Oklahoma City College	2	California State University, Los Angeles	6
6	Oklahoma State University	2	City University of New York, City College	4
7	University of Oklahoma	2	St. Louis University	4
8	Rice University	2	Florida State University	4
9	University of Wyoming	2	University of South Florida	4
10	California State University, Fresno	2	San Diego State University	4
11	Stanford University	2	University of California, Berkeley	4
12	(68 institutions with 1 Ph.D.)		University of Illinois, Urbana	3
13			University of Florida	3
14			University of Texas, El Paso	3
15			California State University, Long Beach	3
16			University of Southern California	3
17			Columbia University	2
18			Indiana University	2
19			Mississippi State	2
20			University of New Orleans	2
21			Abilene Christian College	2
22			University of Houston	2
23			Howard Payne College	2
24			North Texas State University	2
25			Southwest Texas State University	2
26			University of Northern Colorado	2
27			University of Utah	2
28			San Jose State University	2
29			Immaculate Heart College	2
30			St. Mary's College of California	2
31			University of Santa Clara	2
32			Inter American University of Puerto Rico	2

Table III-4 continued

Rank	Arts & Humanities (c) Puerto Rican All Citizens Institution	Number	Asian All Citizens Institution	Number
1	University of Puerto Rico, Rio Piedras	6	University of Hawaii	11
2	City University of New York, Brooklyn College	2	University of California, Berkeley	10
3	City University of New York, Hunter College	2 2	University of Washington	4
4	(23 institutions with 1 Ph.D.)		University of Chicago	3
5			University of Michigan	3
6			Dartmouth College	2
7			Harvard University	2
8			Brown University	2
9			Oberlin College	2
10			Ohio State University	2
11			Depaul University	2
12			University of Wisconsin, Madison	2
13			St. Louis University	2
14			University of Northern Colorado	2
15			University of California, Los Angeles	2
16			University of California, Santa Cruz	2
17			(65 institutions with 1 Ph.D.)	

Table III-4 continued.

Education (a)

Rank	White All Citizens		Black All Citizens	
	Institution	Number	Institution	Number
1	Ohio State University	206	Florida Agricultural and Mechanical University	82
2	University of Illinois, Urbana	178	Southern University and Agricultural and Mechanical College	64
3	University of Florida	177	Wayne State University	53
4	University of Michigan, Ann Arbor	176	Tennessee State University	46
5	Brigham Young University	176	Tuskegee Institute	43
6	City University of New York, Brooklyn College	175	Howard University	42
7	University of Wisconsin, Madison	174	Virginia State College	42
8	Michigan State University	172	Alabama State University	42
9	Florida State University	167	Hampton Institute	37
10	Pennsylvania State University	166	District of Columbia Teachers College	30
11	Indiana University, Bloomington	153	West Virginia State College	30
12	Wayne State University	139	Alcorn State University	29
13	University of Minnesota, Minneapolis	138	Prairie View Agricultural and Mechanical University	29
14	Boston University	133	North Carolina Central University	28
15	University of California, Berkeley	128	Fisk University	28
16	University of Northern Iowa	125	Jackson State University	28
17	University of California, Los Angeles	124	South Carolina State College, Orangeburg	27
18	Southern Illinois University, Carbondale	123	Cheyney State College	26
19	Oklahoma State University	123	Lincoln University, Missouri	25
20	University of Texas, Austin	122	Morgan State University	24
21	Western Michigan University	118	North Carolina Agricultural and Technical State University	24
22	New York University	113	Morehouse College	24
23	University of Utah, Salt Lake City	113	Central State University	23
24	Ball State University	112	Eureka College	23
25	University of Alabama, University	112	University of Arkansas, Pine Bluff	22
26			Grambling State University	22

Table III-4 continued.

Education (b)

Rank	American Indian All Citizens		Chicano All Citizens	
	Institution	Number	Institution	Number
1	Oklahoma State University	7	Texas A & I University	15
2	Northern Oklahoma State University	5	University of New Mexico	11
3	Southeastern Oklahoma State University	5	California State University, Los Angeles	11
4	Kansas State College	4	University of Texas, Austin	10
5	University of Minnesota	3	New Mexico Highlands University	10
6	Pembroke State University	3	University of Texas, El Paso	9
7	University of Florida	3	Pan American University	8
8	East Central Oklahoma State University	3	Adams State College, Colorado	8
9	University of Oklahoma	3	Arizona State University, Tempe	8
10	Oregon State University	3	San Jose State University	8
11	University of Rochester	2	University of California, Los Angeles	8
12	Indiana University	2	University of Northern Colorado	6
13	Southeast Missouri State University	2	New Mexico State University	6
14	Black Hills State College	2	University of Arizona	6
15	Dakota Wesleyan University	2	University of Tampa	5
16	South Dakota State University	2	St. Mary's University	5
17	University of Kansas	2	San Diego State University	5
18	American University	2	Our Lady of the Lake University of San Antonio	4
19	University of Arkansas, Fayetteville	2	University of Southern Colorado	4
20	Oklahoma Panhandle State University	2	University of Albuquerque	4
21	Baylor University	2	Northern Arizona University	4
22	Sam Houston State University	2	California State University, Long Beach	4
23	University of Texas, Austin	2	University of California, Santa Barbara	4
24	University of Northern Colorado	2	University of Florida	3
25	Arizona State University, Tempe	2	Colorado State University	3
26	Western Michigan State College	2	California State University, Fresno	3
27	California State University, Long Beach	2	San Francisco State University	3
28	San Jose State University	2	Occidental College	3
29			University of Southern California	3

Table III-4 continued.

Education (c)

Rank	Puerto Rican All Citizens		Asian All Citizens	
	Institution	Number	Institution	Number
1	University of Puerto Rico, Rio Piedras	32	University of Hawaii	23
2	Inter-American University of Puerto Rico	3	University of California, Los Angeles	6
3	City University of New York, City College	2	University of California, Berkeley	5
4	City University of New York, Hunter College	2	California State University, Los Angeles	4
5	College of the Sacred Heart, Puerto Rico	2	Southern Illinois University	3
6	(24 institutions with 1 Ph.D.)		Florida State University	3
7			Oklahoma Baptist University	3
8			Boston University	2
9			Radcliffe College	2
10			City University of New York, Brooklyn College	
11			Ohio University, Athens	2
12			University of Illinois, Urbana	2
13			Macalester College	2
14			University of Iowa	2
15			University of Utah	2
16			University of Washington	2
17			San Diego State University	2
18			California State University, Northridge	2
19			San Jose State University	2
20			University of Southern California	2
21			(79 institutions with 1 Ph.D.)	

Table III-5
Distribution of Doctorate Recipients 1/, 1973-1976, by Carnegie Classification of Doctorate-Granting Institutions, Racial/Ethnic Group and Sex (Percent)

Carnegie Category of Institution	MEN								WOMEN							
	White	Black	American Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total	White	Black	American Indian	Chicano	Puerto Rican	Asian	Other & Unknown	Total
Research I																
Public	35.9%	35.8%	35.1%	35.6%	31.6%	41.0%	34.2%	35.8%	33.3%	34.7%	31.0%	31.8%	23.8%	49.0%	30.6%	33.3%
Private	18.0	13.0	11.9	13.2	13.5	25.8	25.6	18.6	20.9	12.5	12.4	17.3	19.0	21.7	29.0	21.1
Research II																
Public	17.6	20.2	23.5	13.0	19.4	12.5	15.9	17.5	15.0	20.6	22.1	14.5	15.9	7.7	14.9	15.3
Private	4.5	5.8	2.5	1.9	3.9	2.8	4.5	4.5	5.9	5.9	3.5	1.8	3.2	4.2	5.8	5.8
Doctoral I																
Public	9.3	7.5	11.4	20.2	7.7	8.5	8.6	9.3	8.0	6.5	8.8	12.7	4.8	5.6	6.7	7.8
Private	5.0	6.2	5.0	4.1	9.7	3.3	2.9	4.9	5.2	7.1	7.1	6.4	6.3	4.9	2.7	5.1
Doctoral II																
Public	2.9	3.5	4.0	3.3	-	.8	2.9	2.9	3.4	3.7	8.0	6.4	1.6	1.4	3.0	3.4
Private	.9	.5	1.7	1.4	1.3	1.3	.6	.9	1.0	.3	.9	-	3.2	-	.5	.9
Comprehensive I & II																
Public	1.0	.9	1.0	.6	.4	-	1.0	1.0	1.3	1.2	1.8	-	1.6	-	.9	1.2
Private	.7	.6	.5	1.0	-	.3	.5	.7	.8	1.0	1.8	.9	-	-	.6	.8
Liberal Arts I & II																
Public	.1	-	-	.4	-	-	.1	.1	.1	-	-	-	-	-	.1	.1
Private	.2	.2	-	-	-	.3	.1	.2	.6	.1	-	-	-	1.4	.3	.5
Other																
Public	1.3	.5	1.2	.6	5.2	2.3	1.0	1.3	1.7	.6	1.8	.9	6.3	1.4	1.8	1.7
Private	2.6	5.3	2.2	4.7	3.9	1.5	2.1	2.6	2.7	5.9	.9	7.3	14.3	2.8	3.4	2.9
Not Rated	42	1	-	-	-	-	3	46	9	-	-	-	-	-	-	9
Total	69,708	2,253	404	514	155	400	7.882	81,316	19,482	1,177	113	110	63	143	1,759	22,847

1/ Native-born U.S. citizens only

Source: Survey of Earned Doctorates, National Research Council

III-5 Distribution of Doctorate Recipients, 1973-1976, by Carnegie Classification of Doctorate-Granting Institutions, Racial/Ethnic Group and Sex

Racial/Ethnic Group Differences

Of the U.S. native-born Ph.D.'s, over two-thirds of the Asians received degrees at Research Universities I (the most research-oriented universities). For both sexes and for both public and private Research Universities, Asians showed the highest proportions of any racial/ethnic group. The proportion of doctorates received by Blacks from Research Universities I is smaller than that for all Ph.D.'s, but they received a larger proportion from Research Universities II (the moderately research-oriented universities) than the entire group of Ph.D.'s. American Indians, Chicanos and Puerto Ricans, both male and female, received smaller proportions of doctorates from Research I institutions than the total population of Ph.D.'s. American Indians received a higher proportion of Ph.D.'s from public Research Universities II than the total group of Ph.D.'s. Chicanos show a higher proportion of Ph.D.'s awarded by public Doctoral I institutions. Private institutions in the "Other" category show high proportions of Blacks and Puerto Ricans of both sexes and of Chicano men relative to the population proportion.

Sex Differences

In 1973-1976 the same proportion of men and of women Ph.D.'s, 54.4%, received their degrees from Research Universities I. The differences between the proportions of men and of women receiving doctorates at institutions in various Carnegie categories are quite small. A higher proportion of men received the doctorate at public Research I and II and Doctoral I institutions (62.6%) than the proportion of women (56.4%). On the other hand, 32.0% of the women received the doctorate from private Research Universities I and II and Doctoral I institutions compared with 28.0% of the men. It is interesting to note that 21.1% of the women, compared with 18.6% of the men, received the Ph.D. from Private Research I institutions even though this list of 22 institutions includes two predominantly male institutions (California Institute of Technology and Massachusetts Institute of Technology) that place heavy emphasis on science, and Harvard, Princeton and Yale that formerly were all-male universities.

Table III-6
Distribution of Doctorate Recipients by Year Institution First Granted Ph.D. for Total, Women and Racial/Ethnic Groups, 1973-1976 Combined

YEAR INSTITUTION FIRST GRANTED PHD		TOTAL ALL	TOTAL WOMEN	RACIAL/ETHNIC GROUP 1/							
				WHITE	BLACK	AM IND	CHI-CANO	PTO RICAN	ASIAN	TOTAL REPT	OTHER &UNKN
PRE 1920	N	58676	12863	37915	1441	169	138	77	236	39976	4647
	H1 2/		21.9								
	H2 3/			94.8	3.6	.4	.3	.2	.6		11.6
	V 4/	44.2	46.9	42.5	42.0	32.7	22.1	35.3	43.5	42.3	48.2
1920-1929	N	26452	5506	18138	692	106	160	45	91	19232	1942
	H1		20.8								
	H2			94.3	3.6	.6	.8	.2	.5		10.1
	V	19.9	20.1	20.3	20.2	20.5	25.6	20.6	16.8	20.3	20.1
1930-1949	N	22258	4020	15174	581	117	178	39	129	16218	1349
	H1		18.1								
	H2			93.6	3.6	.7	1.1	.2	.8		8.3
	V	16.8	14.7	17.0	16.9	22.6	28.5	17.9	23.8	17.2	14.0
1950-1976	N	25287	5023	17963	716	125	148	57	87	19096	1703
	H1		19.9								
	H2			94.1	3.7	.7	.8	.3	.5		8.9
	V	19.1	18.3	20.1	20.9	24.2	23.7	26.1	16.0	20.2	17.7
TOTAL ALL	N	132673	27412	89190	3430	517	624	218	543	94522	9641
	H1		20.7								
	H2			94.4	3.6	.5	.7	.2	.6		10.2

1/ Native-born U.S. citizens only
2/ H1, horizontal percentage, gives women as % of all Ph.D.'s
3/ H2, horizontal percentage, gives racial/ethnic group as % of all PhD.'s.
4/ V, vertical percentage, gives number of Ph.D.'s for each institutional category as percentage of all Ph.D.'s for each column.

Source: Survey of Earned Doctorates, National Research Council.

III-6 Distribution of Doctorate Recipients by Year Institution First Granted Ph.D. for Total, Women and Racial/Ethnic Groups, 1973-1976 Combined

Women

During the four years 1973-1976, 20.7% of the doctorates were awarded to women. Of the total doctorates granted, 44.2% were awarded by institutions that first granted Ph.D.'s before 1920. These institutions awarded 21.9% of their Ph.D.'s to women, a higher proportion than that for the institutions that have been granting Ph.D.'s for a shorter period.

Racial/Ethnic Group Differences

Of the U.S. native-born Ph.D. recipients from 1973-1976, 94.4% were White. The institutions that granted Ph.D.'s before 1920 awarded a slightly larger proportion of their Ph.D.'s, 94.8%, to Whites and the institutions that have been granting Ph.D.'s for a shorter period awarded a slightly lower proportion, 94.0%, of their Ph.D.'s to Whites. The four groups of institutions, grouped by year first granted Ph.D., all awarded essentially the same proportion of doctorates to Blacks: 3.6%. Only 0.5% of the Ph.D.'s were awarded to American Indians. The institutions that first granted Ph.D.'s between 1930 and 1976 granted the highest proportion, 0.7% of their Ph.D.'s, to American Indians. Chicanos received 0.7% of the Ph.D.'s. The institutions that awarded Ph.D.'s prior to 1920 granted only 0.3% of their degrees to Chicanos compared with the 1.1% awarded to Chicanos by the institutions that first granted Ph.D.'s in 1930-1949. This same group of institutions also granted the highest proportion of Ph.D.'s to U. S. native-born Asians: 0.8%.

Table III-7

Distribution of 140 Doctorate-Granting Institutions Relative to Percent of Female Faculty in the Institutions and Percent of Female Ph.D.'s in all Doctorate-Granting Institutions, 1976

% Female Ph.D.'s

	Female Faculty	Female Ph.D.'s
Florida Atl. U.	12.2%	50.0%
Columbia U.	13.1	37.5
Emory U.	6.7	33.3
Brown U.	6.8	33.1

	Female Faculty	Female Ph.D.'s
Texas Womans U.	60.6%	97.1%
Bryn Mawr College	37.0	76.8

(14.0%, 23.3%)

28 Institutions
Low % of female faculty
High % of female Ph.D.'s

39 Institutions
High % of female faculty
High % of female Ph.D.'s

% Female Faculty

44 Institutions
Low % of female faculty
Low % of female Ph.D.'s

29 Institutions
High % of female faculty
Low % of female Ph.D.'s

	Female Faculty	Female Ph.D.'s
Massachusetts Inst. of Tech.	7.2%	8.7%
Utah State U.	8.2	8.1
Georgia Inst. of Tech.	4.0	1.9

	Female Faculty	Female Ph.D.'s
Louisiana Tech. U.	17.8%	0 %
U. of Texas, Dallas	15.4	0
Montana State U.	16.1	4.0

Source: American Association of University Professors.

Survey of Earned Doctorates, National Research Council.

III-7 Distribution of 140 Doctorate-Granting Institutions Relative to Percent of Female Faculty in the Institutions and Percent of Female Ph.D.'s in all Doctorate-Granting Institutions, 1976

It has been hypothesized that the lack of role models is one reason women are not high attainers in various fields (Mitchell and Starr, 1971, pp. 30-33; Rossi, 1970, p. 2). Women faculty members of professorial rank could be construed as role models for women graduate students. Available data on women faculty members as a proportion of total faculty members for an institution and the proportion of women Ph.D.'s granted by the institution were analyzed.

Data have been published (American Association of University Professors, 1976) on the number of faculty members by sex for some of the higher education institutions in 1975-1976. This source provides data for 156 of the approximately 300 doctorate-granting institutions. From these data the ratio of women faculty of professorial rank to total faculty of professorial rank was computed for each institution. Since ratios of this type fluctuate widely from year to year for institutions awarding small numbers of doctorates, the following analysis uses data only for the 140 institutions with 10 or more doctorate recipients in 1976. In this group of 140 institutions, 14.0% of the faculty of professorial rank were women. These institutions awarded 23.4% of their 1976 doctorates to women compared with 23.3% for all doctorate-granting institutions. The faculty data on institutions were correlated with data on the percentage of women Ph.D.'s for each of these institutions in 1976 giving a correlation coefficient, r = 0.665.

Table III-7 shows how the 140 institutions are distributed among the four groups defined by those High or Low relative to the 14% female faculty in these institutions and to the 23.3% of doctorates granted to women by all doctorate-granting institutions. In each of the four quadrants of the table corresponding to a group, the most extreme institutions in the group are shown with data for these institutions. Two of the three extreme institutions in the Low-Low group are institutes of technology that specialize in fields not frequently selected by women. In the High-High group, the two extreme institutions have historically been primarily women's institutions. The other two quadrants show fewer institutions and with a

Table III-7: Analysis I

Carnegie Classification of Four Groups of Institutions

		Vertical % of Institutions in Group			
	Female Faculty:	High	High	Low	Low
Carnegie Category	Female Ph.D.'s:	High	Low	High	Low
Research Universities I					
Public		7.7%	13.8%	21.4%	18.2%
Private		5.1	-	21.4	15.9
Research Universities II					
Public		10.2	6.9	21.4	18.2
Private		2.6	3.5	14.3	9.1
Doctoral-Granting Universities I					
Public		15.4	31.0	7.1	20.4
Private		20.5	3.5	-	6.8
Doctoral-Granting Universities II					
Public		12.8	13.8	3.6	2.3
Private		10.2	6.9	-	4.5
Comprehensive Universities and Colleges I					
Public		7.7	13.8	7.1	2.3
Private		-	3.5	3.6	-
Comprehensive Universities and Colleges II					
Private		2.6	-	-	-
Liberal Arts Colleges I					
Private		2.6	-	-	2.3
Teachers Colleges		2.6	-	-	-
Not rated		-	3.5	-	-
Total Number in Group		39	29	28	44

few exceptions they tend to cluster nearer the dividing lines for the groups than do the institutions in the High-High and Low-Low categories.

Table III-7: Analysis I illustrates the differences among the distributions of the four groups of institutions by Carnegie categories. Only 25.7% of the institutions in the High-High group are Research Universities I or II compared with 78.5% of those in the Low-High group and 61.4% of those in the Low-Low group. Over half, 59.0%, of the High-High institutions fall in the category Doctoral-Granting Universities I or II. The High-Low group has the highest proportion in the public Comprehensive University I category - 13.8%. The 39 institutions in the High-High group are listed in Table III-7: Analysis II. Since this analysis is based on only 140 of the approximately 300 doctorate-granting institutions, there are undoubtedly additional institutions that were non-respondents in the AAUP survey that would fall in the High-High group as defined in this section.

Further exploration of the correlations between number (rather than percentage) of women faculty of professorial rank and number of women Ph.D.'s using data for all doctorate-granting institutions would increase the understanding of this relationship. It is obvious that there are other variables, such as the fields in which degrees are awarded, associated with the presence of women faculty that affect the number of doctorates awarded to women.

Table III-7: Analysis II

Institutions with a High Percentage of Female Faculty and a High Percentage of Female Ph.D.'s in 1976

	Female Faculty	Female Ph.D.'s
Texas Woman's University	60.6%	97.1%
Bryn Mawr College	37.0	76.8
Teachers College, Columbia University	25.6	52.2
Memphis State University	18.5	45.2
University of North Carolina - Greensboro	33.2	43.5
Adelphi University	35.3	40.0
Fordham University	20.1	39.9
Georgetown University	17.1	38.2
Ball State University	23.3	36.8
Loyola University	24.1	35.9
Catholic University of America	24.8	34.8
New York University	16.7	34.5
George Peabody College for Teachers	23.6	33.3
Middle Tennessee State University	16.3	33.3
Marquette University	15.9	31.9
Wayne State University	23.5	31.0
University of Houston	14.5	30.6
University of South Carolina	14.2	29.5
Texas Christian University	28.7	29.4
University of Denver	15.0	29.4
Howard University	23.3	29.3
Case Western Reserve University	19.5	29.1
Florida State University	19.0	29.0
Rutgers, The State University	22.6	28.9
Temple University	22.1	28.5
Boston College	14.7	27.8
Kent State University	20.2	27.6
University of Southwestern Louisiana	20.7	27.3
University of Massachusetts - Amherst	14.4	27.2
Georgia State University	18.0	27.1
University of Wisconsin - Milwaukee	18.8	27.1
Northern Illinois University	17.6	26.5
University of North Dakota	16.4	26.0
University of Maryland	15.6	25.9
University of Delaware	17.3	25.4
University of Nevada - Reno	14.9	25.0
U.S. International University	18.6	23.7
University of the Pacific	14.5	23.5
University of North Carolina - Chapel Hill	16.4	23.3

III-8 Institutions that Ranked Above Average in Proportion of Doctorates Granted to Women, 1973-1976

In the four-year period 1973-1976, 132,673 doctorates were granted by United States universities and of these 27,412 or 20.7% were granted to women (Table III-6). The 99 institutions that were above average in the proportion of doctorates granted to women are listed in Table III-8.

Texas Woman's University, at the top of the list, awarding 98.7% of its doctorates to women in the period 1973-76, was established as a single-sex institution with enrollment limited to women. This policy was modified in 1972 when Title IX of the Education Amendments of 1972 prohibited sex discrimination in the admission of students to institutions of higher education receiving federal financial assistance. Bryn Mawr College was also historically a woman's college but admitted men long before 1972.

The list of institutions in Table III-8 contains six of the twelve universities that awarded the largest number of doctorates in the 1973-76 period: the University of Michigan, Ohio State University, Indiana University, Harvard University, New York University and the University of California at Los Angeles. Missing from the list are the three universities awarding the largest number of doctorates: the University of California at Berkeley, University of Wisconsin and University of Illinois at Urbana. Also missing are Michigan State University, University of Minnesota and Stanford University.

A tabulation of the institutions that are above and below average in proportion of doctorates granted to women classified by Carnegie categories (Carnegie Commission on Higher Education, 1973a) as Research Universities I (the most research-oriented universities) and Research Universities II (the moderately research-oriented universities) is shown in Table III-8: Analysis I.

Table III-8: Analysis I

Status of Research Universities
with Respect to Proportion of Ph.D.'s Awarded to Women

Carnegie Category	Proportion of Ph.D.'s Awarded to Women		
	Above Average Institutions	Below Average Institutions	Total
Research Universities I			
Public	10 (33%)	20 (67%)	30
Private	15 (68.2%)	7 (31.8%)	22 52
Research Universities II			
Public	11 (41%)	16 (59%)	27
Private	8 (62%)	5 (38%)	13 40

Clearly, two thirds of the private research universities but just over one-third of the public research universities are above average in the proportion of doctorates awarded to women.

Table III-8

Institutions 1/ that Were Above Average in Proportion of Doctorates Granted to Women, 1973-1976

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
1	Texas Woman's University	148	150	98.7%
2	Bryn Mawr College	117	170	68.8
3	Atlanta University	21	40	52.5
4	University of North Carolina, Greensboro	74	141	52.5
5	Cornell University, Medical College	29	60	48.3
6	Teachers College, Columbia University	400	903	44.3
7	University of California, San Francisco	64	155	41.3
8	Florida Atlantic University	20	49	40.8
9	City University of New York	277	709	39.1
10	Adelphi University	49	128	38.3
11	Hofstra University	60	162	37.0
12	Boston University	366	1,003	36.5
13	University of Missouri, Kansas City	50	137	36.5
14	University of Texas Health Science Center, Dallas	15	43	34.9
15	Fordham University	225	650	34.6
16	Georgia State University	99	290	34.1
17	Columbia University	683	2,012	33.9
18	Baylor College of Medicine	15	46	32.6
19	Boston College	100	312	32.1
20	Brandeis University	135	422	32.0
21	Middle Tennessee State University	14	44	31.8
22	Yeshiva University	68	215	31.6
23	Tufts University	67	213	31.5
24	New York University	707	2,322	30.4
25	Loyola University, Chicago	90	299	30.1
26	Memphis State University	36	120	30.0
27	University of Illinois College of Medicine	46	155	29.7
28	Emory University	97	329	29.5
29	George Peabody College	93	315	29.5
30	Georgetown University	91	310	29.4
31	Catholic University of America	197	690	28.6
32	University of Miami, Florida	109	395	27.6
33	University of Alabama	152	552	27.5
34	University of Pittsburgh	445	1,633	27.3
35	U.S. International University	147	556	26.4
36	Tulane University	108	423	25.5
37	Temple University	213	839	25.4
38	University of Maryland	368	1,448	25.4
39	University of Texas, Houston	31	122	25.4
40	Case Western Reserve University	224	893	25.1
41	Marquette University	45	179	25.1
42	Rutgers University	315	1,256	25.1
43	Howard University	38	152	25.0
44	New School for Social Research	46	184	25.0
45	Virginia Commonwealth University Medical School	16	64	25.0

1/ Limited to institutions that awarded 40 or more doctorates during the period 1973-1976.

Source: Survey of Earned Doctorates, National Research Council.

Table III-8 continued.

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
46	Ball State University	64	257	24.9%
47	University of Toledo	48	193	24.9
48	Harvard University	581	2,350	24.7
49	Florida State University	346	1,407	24.6
50	Nova University	183	746	24.5
51	University of Houston	134	547	24.5
52	Brown University	145	594	24.4
53	University of California, Irvine	77	315	24.4
54	Wayne State University	221	907	24.4
55	Northwestern University	365	1,503	24.3
56	University of Tulsa	27	111	24.3
57	Idaho State University	16	66	24.2
58	University of North Carolina, Chapel Hill	310	1,280	24.2
59	University of Pennsylvania	389	1,606	24.2
60	Duquesne University	14	58	24.1
61	University of New Mexico	134	560	23.9
62	University of South Florida	16	67	23.9
63	Yale University	333	1,391	23.9
64	St. Louis University	133	558	23.8
65	University of South Carolina	100	421	23.8
66	George Washington University	147	621	23.7
67	University of California, Los Angeles	493	2,122	23.2
68	University of Texas, Austin	431	1,872	23.0
69	North Texas State University	101	441	22.9
70	University of Michigan	659	2,894	22.8
71	University of Colorado	258	1,138	22.7
72	Auburn University	76	335	22.7
73	Indiana State University	17	75	22.7
74	University of Denver	84	371	22.6
75	University of Indiana, Bloomington	536	2,370	22.6
76	Northern Illinois University	79	351	22.5
77	University of Massachusetts	300	1,336	22.5
78	University of Kansas	243	1,083	22.4
79	Yeshiva University, Einstein School of Medicine	11	49	22.4
80	East Texas State University	53	238	22.3
81	Kent State University	105	471	22.3
82	University of Alabama, Birmingham	14	63	22.2
83	Wesleyan University, Connecticut	14	63	22.2
84	University of Southern California	427	1,934	22.1
85	Washington University	136	615	22.1
86	Johns Hopkins University	206	945	21.8
87	Duke University	182	837	21.7
88	University of Cincinnati	150	694	21.6
89	SUNY, Binghampton	36	167	21.6
90	University of Rochester	163	759	21.5
91	University of Oregon	240	1,122	21.4
92	University of Tennessee, Knoxville	223	1,042	21.4

Table III-8 continued.

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
93	American University	94	446	21.1
94	Arizona State University	153	727	21.0
95	Illinois State University, Normal	17	81	21.0
96	University of Chicago	377	1,798	21.0
97	Ohio State University	556	2,675	20.8
98	Texas Christian University	22	106	20.8
99	University of Connecticut	162	778	20.8

Table III-9

Institutions [1] that Granted the Highest Proportions of Doctorates to Women by Field, 1973-1976

Physical Sciences and Engineering

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
1	Wesleyan University, Connecticut	6	24	25.0
2	Boston College	8	33	24.2
3	Temple University	15	68	22.1
4	Clark University	4	20	20.0
5	Villanova University	4	21	19.0
6	Fordham University	8	44	18.2
7	Boston University	13	75	17.3
8	Emory University	8	49	16.3
9	American University	9	57	15.8
10	Howard University	5	32	15.6
11	Texas Christian University	4	26	15.4
12	Baylor University	3	20	15.0
13	Tufts University	6	40	15.0
14	Yeshiva University	5	34	14.7
15	Northeastern University	11	77	14.3
16	University of Missouri, Kansas City	3	22	13.6
17	Brandeis University	12	79	13.2
18	Georgetown University	5	38	13.2
19	Kent State University	6	46	13.0
20	University of California, San Francisco	4	31	12.9
21	Duke University	21	164	12.8
22	City University of New York	16	134	11.9
23	University of Miami, Florida	6	58	10.3
24	University of California, Riverside	11	108	10.2
25	University of Illinois, Chicago Circle	10	100	10.0
26	William & Mary College	3	30	10.0

[1] Limited to institutions that awarded 20 or more doctorates during the period 1973-1976.

Source: Survey of Earned Doctorates, National Research Council.

III-9 Institutions that Granted the Highest Proportions of Doctorates to Women by Field, 1973-1976

The list on page 136 shows the 25 institutions that awarded 20 or more doctorates in the physical sciences and engineering in the period 1973-1976 and that ranked highest in the percentage of doctorates in the physical sciences and engineering granted to women. Similar tables for other fields are given on pp. 139-142. There is a marked difference among fields in the range for the proportion of women Ph.D.'s for the institutions in these lists:

Field	Range for Top 25	Range with Top Institution Deleted
Physical Science and Engineering	10.0%-25.0%	10.0%-24.2%
Life Sciences	30.4%-100.0%	30.4%-65.9%
Social Sciences	31.2%-68.0%	31.2%-47.4%
Arts and Humanities	38.5%-70.7%	38.5%-59.6%
Education	37.5%-97.4%	37.5%-57.7%

Since the institution that ranked first on four of the five lists is historically a women's college or university, the upper bound of the range excluding the top institution is also shown. The proportion of Ph.D.'s awarded to women is much lower for the field of physical sciences and engineering than for the other fields.

Many of the major research universities are missing from these lists. A count has been made of Research Universities I (the most research-oriented universities) and Research Universities II (the moderately research-oriented universities) appearing on these five lists. (These two categories of the Carnegie classification of doctorate-granting universities are defined on p. 87.) As can be seen from Table III-9: Analysis I below, the proportion of the 57 Public Research Universities I and II on the lists is very low - the largest number in any of the fields being 4.

Table III-9: Analysis I

Number of Research Universities Included in the Table III-9 Lists

Field	Research Universities I Public n=30	Research Universities I Private n=22	Research Universities II Public n=27	Research Universities II Private n=13	Total
Physical Sciences and Engineering	0	3	2	4	9
Life Sciences	2	5	1	5	13
Social Sciences	1	4	2	5	12
Arts and Humanities	2	5	2	5	14
Education	4	5	1	1	11

Of the 81 institutions shown in the five lists in Table III-9, 54 are above average in the proportion of total Ph.D.'s granted to women and are included in Table III-8. Two of the institutions appear on the lists for four fields and 11 institutions are listed for three fields. These institutions, most of which are in northeastern cities, are shown in Table III-9: Analysis II.

Table III-9: Analysis II

Institution	Freq. of Listing	Rank in Field Where Listed Phys. Sci & Eng.	Life Sci.	Soc. Sci.	Arts and Hum.	Edu.	Rank in % Women Ph.D.'s	Carnegie Classification
Boston University	4	7	15	3		13	12	Research U-II
City U of New York	4	22	10	8	3		9	Research U-II
Brandeis University	3	17		6	20		20	Research U-II
Case Western Reserve U.	3			9	10	3	40	Research U-I
Columbia University	3		3	5	19		17	Research U-I
Fordham University	3	6		12		9	15	Doctoral Granting U-I
George Washington U.	3		7	22	6		66	Research U-II
Howard University	3	10	13		9		43	Doctoral Granting U-I
Northwestern University	3		11	25		22	55	Research U-I
Tufts University	3	13	9		2		23	Research U-II
U. of Calif., Irvine	3		22	23	12		53	Doctoral Granting U-I
University of Maryland	3			24	22	18	38	Research U-I
U. of Miami, Florida	3	23			21	15	32	Research U-I

Table III-9 Continued

Life Sciences

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
1	Texas Woman's University	27	27	100.0
2	Catholic University of America	29	44	65.9
3	Columbia University	63	124	50.8
4	University of California, San Francisco	51	103	49.5
5	Cornell University, Medical College	29	60	48.3
6	New York University	107	239	44.8
7	George Washington University	29	66	43.9
8	Georgetown University	26	64	40.6
9	Tufts University	14	35	40.0
10	City University of New York	44	111	39.6
11	Northwestern University	39	101	38.6
12	University of Pittsburgh	63	170	37.1
13	Howard University	16	44	36.4
14	State University of New York, Albany	9	26	34.6
15	Boston University	36	105	34.3
16	Rice University	7	21	33.3
17	University of Texas Health Center, Dallas	9	27	33.3
18	Massachusetts Institute of Technology	44	134	32.8
19	Baylor College of Medicine	15	46	32.6
20	Washington University, Missouri	28	87	32.2
21	Louisiana State University School of Medicine	9	29	31.0
22	University of California, Irvine	25	81	30.9
23	University of South Carolina	8	26	30.8
24	University of Colorado	38	124	30.6
25	University of Louisville	7	23	30.4

Table III-9 Continued

Social Sciences

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
1	Bryn Mawr College	34	50	68.0
2	Adelphi University	46	97	47.4
3	Boston University	76	171	44.4
4	Yeshiva University	45	102	44.1
5	Columbia University	249	592	42.1
6	Brandeis University	38	91	41.8
7	Georgia State University	29	70	41.4
8	City University of New York	88	214	41.1
9	Case Western Reserve University	61	150	40.7
10	Emory University	30	75	40.0
11	University of Illinois, Chicago Circle	12	31	38.7
12	Fordham University	60	157	38.2
13	University of North Carolina, Greensboro	10	27	37.0
14	St. Louis University	36	102	35.3
15	Boston College	30	88	34.1
16	Long Island University, Brooklyn Center	10	30	33.3
17	University of Alabama	17	52	32.7
18	Catholic University of America	40	123	32.5
19	George Peabody University	27	83	32.5
20	Loyola University, Chicago	24	74	32.4
21	Wayne State University	55	172	32.0
22	George Washington University	40	126	31.7
23	University of California, Irvine	24	76	31.6
24	University of Maryland	79	250	31.6
25	Northwestern University	106	340	31.2

Table III-9 continued

Arts and Humanities

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
1	Bryn Mawr College	53	75	70.7
2	Tufts University	28	47	59.6
3	City University of New York	108	191	56.5
4	University of Arkansas	12	24	50.0
5	Middlebury College	10	20	50.0
6	George Washington University	23	50	46.0
7	Brown University	96	211	45.5
8	State University of New York, Albany	19	42	45.2
9	Howard University	12	27	44.4
10	Case Western Reserve University	72	166	43.4
11	Arizona State University	12	28	42.9
12	University of California, Irvine	23	55	41.8
13	New York University	244	584	41.8
14	Loyola University, Chicago	27	65	41.5
15	University of California, Santa Cruz	14	34	41.2
16	American University	16	39	41.0
17	Rice University	32	78	41.0
18	University of Mississippi	9	22	40.9
19	Columbia University	262	655	40.0
20	Brandeis University	59	149	39.6
21	University of Miami, Florida	17	43	39.5
22	University of Maryland	57	145	39.3
23	Purdue University	22	56	39.3
24	University of Pennsylvania	144	369	39.0
25	University of California, Riverside	20	52	38.5

Table III-9 Continued

Education

Rank	Institution	Women Doctorates	Total Doctorates	Percent Women
1	Texas Woman's University	74	76	97.4
2	Atlanta University	15	26	57.7
3	Case Western Reserve University	26	49	53.1
4	Hofstra University	24	48	50.0
5	University of North Carolina, Greensboro	38	76	50.0
6	University of Missouri, Kansas City	30	62	48.4
7	Georgia State University	59	133	44.4
8	Teachers College, Columbia University	400	903	44.3
9	Fordham University	96	225	42.7
10	University of Texas, Austin	159	379	42.0
11	University of Kentucky	43	103	41.7
12	Florida Atlantic University	20	49	40.8
13	Boston University	117	437	40.5
14	Memphis State University	30	74	40.5
15	University of Miami, Florida	47	118	39.8
16	University of Rochester	33	83	39.8
17	University of Houston	79	199	39.7
18	University of Maryland	170	432	39.4
19	University of South Carolina	46	117	39.3
20	University of Cincinnati	44	115	38.3
21	University of California, Berkeley	102	267	38.2
22	Northwestern University	80	210	38.1
23	Texas Technological University	19	50	38.0
24	Harvard University	92	243	37.9
25	Northeast Louisiana University	9	24	37.5

RECOMMENDATIONS FOR FURTHER STUDY

Time and resources did not permit all the tabulations of data that would have been desirable. The following discussion points out some of the kinds of tabulations that would appear to be useful.

The data from the Survey of Earned Doctorates would permit studying a decade of change in the characteristics of men and women Ph.D.'s. Tabulations could be made for the 1963-1966 cohorts of Ph.D.'s and for the 1973-1976 cohorts by sex for: field of doctorate, field of doctorate by field of baccalaureate, marital status at time of doctorate, father's educational level by field, mother's educational level by field, number of years out from B.A. to graduate school entrance by sex, numbers of years out from graduate school entrance to doctorate and age distribution at doctorate. A comparable analysis of a decade of change for minority Ph.D.'s would not be feasible because data are available on racial/ethnic groups for only 12% of the pre-1973 Ph.D.'s and the number of minority Ph.D.'s in the 1963-1966 period was very small.

One of the themes that occurs repeatedly in this report is the need for tabulations of data by field of doctorate, although when field is held constant, as in Table I-11 (Baccalaureate Field of Ph.D. recipients), the small numbers of cases prohibit reasonable generalizations for groups other than Blacks and Whites. On the assumption that the numbers of minority doctorate recipients will continue to grow, such tabulations by field for all groups should become feasible within a year or two.

The need for these tabulations is posed, for example, by the heavy concentrations of Asians in the biological sciences and Blacks in education (Table I-11) which suggest that statistics by field would help in interpreting some of the findings of other tables. For example, it would appear that the median age at which Asians complete their Ph.D.'s is lower than that for the members of other groups because they specialize in fields in which the degree is customarily obtained at an early age. Conversely, it appears reasonable to hypothesize that Blacks are older than others when the degree is awarded because this pattern is typical of education Ph.D.'s.

Another study utilizing the data of the Earned Doctorate Survey has made such tabulations. The report (National Research Council, 1977) of the committee studying biomedical and behavioral scientists analyzed the data for these groups and discovered that field of doctorate provides an explanation of some findings but not of others. Asians in the behavioral sciences, for example, do not finish their degrees when younger than others. On the other hand, Blacks, particularly Black men, were older than others when they obtained the degree in every field. In this case, field of doctorate is not a sufficient explanation. Nonetheless, tabulations by field would serve to clarify a number of apparent relationships.

Data are also available to respond to another question that has been posed concerning minority enrollment of recent years. It has been hypothesized that the increased availability of opportunities for minorities in higher education in recent years has encouraged many older individuals to return to school and that once this wave of older individuals has passed, there may be a levelling off of minority enrollments (National Board of Graduate Education, 1976, pp. 73-74). Data on age at entrance to graduate school are available but were not tabulated for this report. An answer to the hypothesis might be provided by studying trend data on entrance to graduate school by field.

This report has not differentiated between the Ph.D. degree and applied research doctorates such as the Ed.D., D.A. and D.M.A., some of which do not require a dissertation. A comparative analysis of the trends in number of applied research doctorates (Ed.D., D.A., D.M.A., etc.) by sex and by majority/minority status would illuminate the extent of and participation in these degree programs.

Comparisons of the two sexes would profit from another kind of tabulation, the comparison by marital status. While there now appears to be little or no sex discrimination with regard to graduate admissions or fellowship support (Table I-16), women are still at a disadvantage in comparison with men in terms of such measures as age when the degree is awarded (Table I-8), elapsed time from B.A. to entrance to graduate school (Table I-14) and years out of school between entrance to graduate school and Ph.D. (Table I-15).

A number of studies have found marriage to act as a barrier to continuity of graduate enrollment and attainment of degrees by women. The Survey of Earned Doctorates includes a question on marital status and would permit tabulations of educational patterns and postdoctoral plans with marital status held constant. Many more studies have pointed out the effect of marital status on the professional activity of women. The Survey of Doctoral Scientists and Engineers does not currently request marital status on its questionnaire so that it has not been possible to examine the relationship of this factor to employment status, employment sector, job activity or salary.

A detailed and interesting study could be made of the changing role of various types of baccalaureate and doctoral institutions of male and female Ph.D.'s and of Ph.D.'s in the various racial/ethnic groups. This study would be enriched by using not only the number of doctorates, since this tends to favor the large institutions, but by also analyzing percentages of total graduates of baccalaureate institutions who obtained doctorates and percentages of total doctorates in sex and racial/ethnic groups for doctorate-granting institutions. The Tidball-Kistiakowsky study (1976) used this method of assessing productivity of institutions.

Tables on institutions ranked by percent of Ph.D.'s granted to members of minority groups could be developed comparable to Tables III-8 and III-9 for women. A study of institutional trends in the production of minority Ph.D.'s could be carried out for 1973-1976.

REFERENCES

American Association of University Professors. "Nearly Keeping Up: Report on the Economic Status of the Profession, 1975-1976." AAUP Bulletin, pp. 195-284, 1976.

Astin, Helen S. The Woman Doctorate in America. New York: Russell Sage Foundation, 1969.

_________. "Career Profiles of Women Doctorates," pp. 139-161 in Alice S. Rossi and Ann Calderwood, eds., Academic Women on the Move. New York: Russell Sage Foundation, 1973.

_________ and Alan E. Bayer. "Sex Discrimination in Academe," pp. 333-356 in Alice S. Rossi and Ann Calderwood, eds., Academic Women on the Move. New York: Russell Sage Foundation, 1973.

Bernard, Jessie. Academic Women. University Park: Pennsylvania State University Press, 1964.

Bock, E. Wilbur. "Farmer's Daughter Effect: The Case of the Negro Female Professionals." Phylon, 30, No. 1: 17-26, 1969.

Carnegie Commission on Higher Education. A Classification of Institutions of Higher Education. Berkeley: Carnegie Foundation for the Advancement of Teaching, 1973a.

_________. Opportunities for Women in Higher Education. New York: McGraw-Hill, 1973b.

Centra, John. Women, Men and the Doctorate. Princeton: Educational Testing Service, 1974.

Dayton, C. M. and W. D. Schafer, "Extended Tables of t and Chi-square for Bonferroni Tests with Unequal Error Allocation." Journal of the American Statistical Association, 68, No. 341: 78-83, 1973.

Epstein, Cynthia. "Positive Effects of the Multiple Negative: Explaining the Success of Black Professional Women," pp. 150-173 in Joan Huber, ed., Changing Women in a Changing Society. Chicago: University of Chicago Press, 1973.

Feldman, Saul D. Escape from the Doll's House. Women in Graduate and Professional School Education. New York: McGraw-Hill, 1974.

Galenson, M. Women and Work: An International Comparison. Ithaca: Cornell University Press, 1973.

Gilford, Dorothy M. and Peter D. Syverson. Summary Report 1976: Doctorate Recipients from United States Universities. Washington, D. C.: National Academy of Sciences, 1977.

Hansen, Morris H., William N. Hurwitz and William G. Madow. Sample Survey Methods and Theory, Volume I: Methods and Applications. New York: Wiley, 1953.

Harris, Patricia R. "Problems and Solutions in Achieving Equality for Women," pp. 11-26 in W. Furniss and P. Graham, eds., Women in Higher Education. Washington, D. C.: American Council on Education, 1973.

Kreps, Juanita. Sex in the Marketplace: American Women at Work. Baltimore: Johns Hopkins Press, 1971.

Maxfield, Betty D., Nancy C. Ahern and Andrew Spisak. Employment Status of Ph.D. Scientists and Engineers 1973 and 1975. Washington, D. C.: National Academy of Sciences, 1976.

Mitchell, Joyce M. and Rachel M. Starr. "A Regional Approach for Analyzing the Recruitment of Academic Women," pp. 25-47 in L. S. Fidell and J. DeLamater, eds., Women in the Professions. Beverly Hills: Sage Publications, 1971.

Morlock, Laura. "Discipline Variation in the Status of Academic Women," pp. 255-312, in Alice S. Rossi and Ann Calderwood, eds., Academic Women on the Move. New York: Russell Sage Foundation, 1973.

National Board on Graduate Education. Minority Group Participation in Graduate Education. Washington, D. C.: National Academy of Sciences, 1976.

National Research Council. Minority Groups among United States Doctorate Level Scientists, Engineers and Scholars, 1973. Washington, D. C.: National Academy of Sciences, 1974.

________. Summary Report 1975: Doctorate Recipients from United States Universities. Washington, D. C.: National Academy of Sciences, 1976a.

________. Doctoral Scientists and Engineers in the United States, 1975 Profile. Washington, D. C.: National Academy of Sciences, 1976b.

________. Personnel Needs and Training for Biomedical and Behavioral Research, 1977 Report. Washington, D. C.: National Academy of Sciences, 1977.

Radcliffe Committee on Graduate Education of Women. Graduate Education for Women: The Radcliffe Ph.D. Cambridge: Harvard University Press, 1956.

Robinson, Lora H. "Institutional Variation in the Status of Academic Women," pp. 199-238, in Alice H. Rossi and Ann Calderwood, eds., Academic Women on the Move. New York: Russell Sage Foundation, 1973.

Rossi, Alice S. "Status of Women in Graduate Departments of Sociology, 1968-1969." American Sociologist, 5, No. 1: 1-11, 1970.

Tidball, M. Elizabeth and Vera Kistiakowsky. "Baccalaureate Origins of American Scientists and Scholars." Science, 93, No. 4254: 646-652, 1976.

U. S. Bureau of the Census. Census of Population: 1970. Subject Report PC(2)-1C. "Persons of Spanish Origin." Washington, D. C.: U.S. Government Printing Office, 1973a.

________. Census of Population: 1970. Subject Report PC(2)-1E. "Puerto Ricans in the United States." Washington, D. C.: U.S. Government Printing Office, 1973b.

__________. Census of Population: 1970. Subject Report PC(2)-1F. "American Indians." Washington, D. C.: U.S. Government Printing Office, 1973c.

__________. Census of Population: 1970. Subject Report PC(2)-1G. "Japanese, Chinese and Filipinos in the United States." Washington, D. C.: U.S. Government Printing Office, 1973d.

__________. Census of Population: 1970. Subject Report PC(2)-5B. "Educational Attainment." Washington, D. C.: U.S. Government Printing Office, 1973e.

__________. "Standards for Discussion and Presentation of Errors in Data." Technical Paper 32. Washington, D. C.: U.S. Government Printing Office, 1974.

__________. "Educational Attainment in the United States: March 1975," Current Population Reports, Series P-20, No. 295. Washington, D. C.: U.S. Government Printing Office, 1976a.

__________. Statistical Abstract of the United States: 1976. 97th edition. Washington, D. C.: U.S. Government Printing Office, 1976b.

__________. "Persons of Spanish Origin in the United States: March 1976." Current Population Reports, Series P-20, No. 310. Washington, D. C.: U.S. Government Printing Office, 1977.

U. S. Commission on Civil Rights. Puerto Ricans in the Continental United States: An Uncertain Future. Washington, D. C., 1976.

U. S. Department of Labor. Employment Standards Administration. Women's Bureau. 1975 Handbook on Women Workers. Washington, D. C.: U.S. Government Printing Office, 1975.

APPENDIX A

FINE FIELD OF PH.D. BY CITIZENSHIP AND BY RACIAL/ETHNIC GROUP FOR ALL DOCTORATE RECIPIENTS, 1973-1976

Appendix A
Fine Field of Ph.D. by Citizenship and Racial/Ethnic Group for All Doctorate Recipients, 1973-1976 - Part I[1]

FIELD OF PH.D.		TOTAL				WHITE				BLACK				AMER. INDIAN
		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
TOTAL ALL FLDS	N	108497	7026	13560	132673	92099	2431	5464	100149	3495	197	531	42[illegible]5	526
PHYSCL SCI SBT	N	14614	1448	2854	19393	12656	353	1028	14059	143	12	49	205	51
MATH SUBTOTAL	N	3420	282	777	4590	2950	73	346	3375	37	3	11	51	15
ALGEBRA	N	411	29	68	508	372	9	25	406	6	1	4	11	2
ANALYSIS (OLD)	N	604	40	127	773	522	10	53	586	8		1	9	2
GEOMETRY	N	84	10	25	119	69	1	12	82		1		1	
LOGIC	N	107	2	15	124	94	1	7	102					
NUMBER THEORY	N	87	3	17	107	78	1	4	83					
PROB,MATH STAT	N	445	53	138	644	396	15	62	474	6		1	7	2
TOPOLOGY	N	331	16	45	393	283	3	22	309	4			4	1
COMPUTING THRY	N	563	55	105	740	499	18	53	571	2		1	3	6
OPERATIONS RES	N	80	8	28	118	70	2	19	91	1		1	2	1
APPLIED MATH	N	325	33	88	460	273	8	41	323	4	1	3	6	1
MATH, GEN	N	232	22	105	427	164	3	39	207	3			3	
MATH, OTHER	N	150	11	16	177	130	2	9	141	3			3	
PHYS &AST SUBT	N	3970	408	947	5458	3401	115	319	3838	24	3	10	37	13
ASTRONOMY	N	220	5	31	259	196	4	20	220					2
ASTROPHYSICS	N	241	6	37	286	204	2	19	225	1			1	
ATOMIC & MOLEC	N	392	30	74	497	351	7	25	383					1
ELECTROMAG	N	32	7	4	43	30	2	1	33					
MECHANICS	N	11	1	5	17	9		1	10	1			1	
ACOUSTICS	N	45	2	2	49	44	1	1	46					
FLUIDS	N	65	11	13	90	60	2	5	67					
PLASMA PHYSICS	N	199	22	35	258	167	4	12	183					2
OPTICS	N	108	10	21	139	91		9	100		1		1	
THERMAL PHYS	N	31	7	7	45	27	1		28					
ELEMENT PART	N	448	45	124	620	389	16	55	460	5		4	9	1
NUCLEAR STRUCT	N	405	40	108	553	359	14	38	411	2	1	1	4	
SOLID STATE	N	980	133	234	1351	855	31	66	952	8	1	4	13	5
PHYSICS, GEN	N	386	59	184	736	275	20	41	339	1		1	2	1
PHYSICS, OTHER	N	407	30	68	515	344	11	26	381	6			6	1
CHEMISTRY SUBT	N	5479	602	785	7050	4774	106	201	5091	81	5	19	105	12
ANALYTICAL CH	N	495	24	46	565	450	4	13	467	8	2		10	2
INORGANIC CHEM	N	816	43	57	917	705	8	12	725	16			16	3
ORGANIC CHEM	N	1936	176	236	2355	1692	35	53	1782	32	1	7	40	3
NUCLEAR CHEM	N	84	9	8	101	76	1	5	82	2	1		3	
PHYSICAL CHEM	N	1240	155	189	1591	1093	18	42	1154	15	1	4	20	3
THEORETICAL CH	N	159	15	22	196	144	4	13	161	3		1	4	
AGRICLT & FOOD	N	25	9	8	44	21	1	3	25	1			1	
PHARMACEUTICAL	N	165	47	20	236	144	9	8	161	2		1	3	
POLYMER CHEM	N	76	24	29	130	70	3	6	79					
CHEMISTRY, GEN	N	3[illegible]4	66	136	666	214	16	37	274	2		5	7	1
CHEM, OTHER	N	179	34	34	249	165	7	9	181			1	1	

[1] See page 155 for additional racial/ethnic groups.

Source: Survey of Earned Doctorates, National Research Council

Appendix A - Part I continued

FIELD OF PH.D.		TOTAL U.S.	TOTAL NON-U.S. PERM.	TOTAL NON-U.S. TEMP.	TOTAL TOTAL	WHITE U.S.	WHITE NON-U.S. PERM.	WHITE NON-U.S. TEMP.	WHITE TOTAL	BLACK U.S.	BLACK NON-U.S. PERM.	BLACK NON-U.S. TEMP.	BLACK TOTAL	AMER. INDIAN TOTAL
EARTH SCI SUBT	N	1745	156	345	2295	1531	59	162	1755	1	1	9	12	11
MINERAL, PETROL	N	139	8	28	178	124	5	12	142			3	3	
GEOCHEMISTRY	N	145	10	28	186	126	2	17	146					1
STRATIG, SEDIM	N	176	6	21	203	160	5	12	177			1	1	1
PALEONTOLOGY	N	155	5	7	168	138	3	5	147					2
STRUCTURAL GEO	N	66		8	74	61		6	67					
GEOPHYSICS	N	182	29	55	272	161	7	21	189			1	2	2
GEOPHYSICS SE	N	28	2	9	40	25	1	5	31					
GEOMORPH (350)	N	98	5	6	109	87	5	5	97					1
HYDROLOGY	N	56	8	14	80	46	4	5	55					1
OCEANOGRAPHY	N	286	22	29	344	242	11	15	268					2
METEOROLOGY	N	131	22	29	183	115	2	13	130			1	1	
ATMOS PHY&CHEM	N	13	1	2	16	12		1	13					
ATMOS DYNAMICS	N	11		3	14	9		1	10					
ATMOS SCI, OTHR	N	13	3	6	23	13		2	15					
APPL GEO (391)	N	64	7	27	98	58	3	15	76			1	1	
FUEL TECH(395)	N	7	9	21	37	7	2	5	14					
EARTH SCI, GEN	N	95	13	29	162	80	4	12	96	1	1	1	3	
EARTH SCI, OTHR	N	78	6	23	108	67	5	10	82			1	1	1
ENGINRNG TOTAL	N	7078	1856	2928	12212	6023	429	1029	7493	55	20	49	124	24
AERONAUT&ASTRO	N	394	66	111	578	336	20	48	404	2		2	4	3
AGRICULTRL ENG	N	127	17	71	220	116	2	24	142			5	5	1
BIOMEDICAL ENG	N	225	30	24	282	202	11	9	223	1			1	4
CIVIL ENG	N	562	220	439	1286	451	43	168	662	4	2	3	9	4
CHEMICAL ENG	N	778	268	401	1480	659	48	109	817	2	1	3	6	2
CERAMIC ENG	N	67	11	16	97	61	1	4	66					
COMPUTER ENG	N	125	22	71	221	109	8	28	145					1
ELECTRICAL ENG	N	1393	313	520	2314	1187	74	182	1446	14	6	12	32	1
ELECTRONICS EN	N	227	53	73	353	194	11	28	233	5	2		7	1
INDUSTRIAL ENG	N	237	32	81	360	199	15	27	241	3		2	5	
NUCLEAR ENG	N	306	51	98	463	267	17	34	320	2		1	3	
ENGINEER. MECH	N	342	138	135	619	291	24	44	359	4		2	6	1
ENGINEER. PHYS	N	68	14	14	97	60	5	6	72	1			1	
MECHANICAL ENG	N	825	229	293	1369	693	42	105	841	8	4	10	22	2
METALURGY(475)	N	280	76	142	507	235	16	42	294	2	2	4	8	
SYS DESGN(476)	N	94	17	36	147	87	3	15	105		1		1	
OPERATIONS RES	N	255	66	79	403	231	24	42	297	3			3	
FUEL TECH(479)	N	13	12	22	56	12	6	12	30			1	1	
SANITARY ENG	N	100	25	30	155	85	8	9	102	1	1	2	4	1
MINING ENG	N	9	8	9	27	8	2	2	12			1	1	
MATERIALS SCI	N	270	87	116	498	229	17	29	275	2	1	1	4	
ENG, GENERAL	N	79	24	39	173	64	9	13	88					
ENG, OTHER	N	302	77	108	507	247	23	49	319	1			1	3
LIFE SCI TOTAL	N	15426	1265	2762	19988	13348	368	927	14662	237	32	136	405	66
BIO SCI SUBT	N	10601	707	1215	13080	9255	217	415	9894	171	14	38	223	47
BIOCHEMISTRY	N	1963	200	239	2470	1685	51	65	1801	28	2	7	37	10
BIOPHYSICS	N	353	30	52	472	308	9	17	335	5			5	1
BIOMET, BIOSTAT	N	115	9	28	154	96	5	13	114		1	1	2	
ANATOMY	N	445	21	15	501	389	9	6	404	5			5	2

Appendix A - Part I continued

FIELD OF PH.D.		TOTAL				WHITE				BLACK				AMER. INDIAN
		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
CYTOLOGY	N	141	11	9	166	123	1	2	126	5	1	1	7	
EMBRYOLOGY	N	83	1	7	91	70		3	73	1			1	
IMMUNOLOGY	N	236	19	25	283	206	9	11	226	6	1	1	8	1
BOTANY	N	620	19	69	723	529	8	17	554	6		2	8	2
ECOLOGY	N	511	12	40	565	445	6	24	475	5		1	6	6
HYDROBIOLOGY	N	47	1	1	49	40	1	1	42					
MICROBIO &BACT	N	1237	102	108	1486	1044	27	31	1105	32	2	3	37	8
ANIMAL PHYSIOL	N	1132	61	81	1287	999	26	29	1055	12	2	1	15	1
PLANT PHYS	N	211	20	62	297	189	5	26	220	2			2	3
ZOOLOGY	N	1021	18	55	1119	866	4	19	889	21	1	4	26	4
GENETICS	N	401	28	109	552	347	9	44	400	9	1	7	17	2
ENTOMOLOGY	N	507	27	127	673	456	9	35	500	4	2	6	12	2
MOLECULAR BIO	N	479	35	46	563	420	11	17	448	9			9	
NUTRITION/DIET	N	57	10	16	84	50	2	7	59	1	1	1	3	1
BIO SCI, GEN	N	607	32	54	758	475	11	21	509	10		1	11	1
BIO SCI, OTHER	N	635	51	72	787	518	14	27	559	10		2	12	3
AG SCI SUBT	N	2463	290	1250	4050	2221	76	396	2696	21	10	79	111	13
AGRONOMY	N	303	22	230	563	271	3	58	332	4	2	17	23	1
AG ECON	N	398	43	236	685	353	9	84	447	5	3	11	20	3
ANIMAL HUSBAND	N	72	3	15	90	60	1	7	68	1		1	2	
FOOD SCI &TECH	N	195	79	118	395	173	21	38	233	1		6	7	1
FISH &WILDLIFE	N	188	11	20	220	167	2	5	174	1			1	1
FORESTRY	N	221	12	81	317	205	3	31	239			4	4	
HORTICULTURE	N	134	12	74	222	119	4	16	140	3	1	6	10	
SIOLS&SOIL SCI	N	178	27	148	358	157	12	53	222	2	2	9	13	
ANIMAL SCI	N	319	39	131	498	305	10	49	364	2	2	10	14	3
PHYTOPATHOLOGY	N	243	24	103	376	221	7	31	259	1		9	10	3
AG, GENERAL	N	9	2	14	26	9	1	4	14			1	1	
AG, OTHER	N	203	16	80	300	181	3	20	204	1		5	6	1
MED SCI SUBT	N	1797	231	252	2403	1542	63	94	1706	39	8	17	64	6
MED & SURGERY	N	13	4	7	24	10		1	11					
PUBLIC HEALTH	N	332	23	39	430	272	12	18	306	21	2	2	25	3
VETERINARY MED	N	71	7	47	127	62	3	20	85		1	1	2	
HOSPITAL ADMIN	N	19			19	17			17					
PARASITOLOGY	N	69	5	6	82	64	1	3	70		1		1	
PATHOLOGY	N	228	35	29	320	199	12	8	219	4	2	4	10	2
PHARMACOLOGY	N	564	56	54	707	494	13	22	529	10	2	6	18	
PHARMACY	N	153	77	34	266	138	10	10	158	3		2	5	
MED SCI, GEN	N	54	5	3	64	37			37			1	1	1
MED SCI, OTHER	N	294	19	33	364	249	12	12	274	1		1	2	
ENVIRONM. SCI	N	365	37	45	455	330	12	22	366	6		2	8	
SOCIAL SCI TOT	N	21244	886	2205	24996	18339	423	1073	19871	498	57	122	680	96
ANTHROPOLOGY	N	1340	41	84	1516	1127	22	38	1191	24	2	2	29	9
COMMUNICATIONS	N	904	23	44	993	820	10	25	855	24	1		25	4
SOCIOLOGY	N	2182	122	277	2658	1865	59	142	2071	86	11	13	110	8
ECONOMICS	N	2425	220	729	3466	2117	97	342	2560	23	7	44	74	8
ECONOMETRICS	N	63	11	33	107	56	4	7	67					1

Appendix A - Part I continued

		TOTAL				WHITE				BLACK				AMER. INDIAN
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
STATISTICS	N	92	17	58	180	78	6	17	102	1			1	
GEOGRAPHY	N	599	33	99	753	524	22	55	602	13	1	12	26	6
AREA STUDIES	N	100	13	13	130	75	4	5	84	2	4	3	9	
POL SCI,PUB AD	N	1920	112	236	2343	1604	27	94	1727	40	15	17	73	3
POLITICAL SCI	N	518	22	75	628	468	9	35	513	11	3	5	19	3
PUBLIC ADMIN	N	65	4	20	96	45	2	3	52	4	1	1	6	1
INTL RELATIONS	N	382	26	80	496	311	11	28	352	2	4	10	16	4
URBAN&REG PLAN	N	214	24	45	291	177	12	23	213	12	4	2	18	
SOCIAL SCI,GEN	N	121	5	9	143	96	4	3	103	4		1	5	
SOC SCI, OTHER	N	419	19	52	513	343	12	24	379	16		6	22	2
PSYCH SUBTOTAL	N	9900	194	351	10683	8633	122	232	9000	236	4	6	247	47
CLINICAL PSYCH	N	3085	43	54	3209	2744	33	39	2822	68	1	3	72	12
COUNSEL & GUID	N	857	10	26	898	735	8	18	761	32		1	33	6
DEVEL &GERONT	N	630	15	28	681	562	9	14	585	8			8	1
ED PSYCH	N	456	14	13	495	387	7	6	400	17			17	2
SCHOOL PSYCH	N	428	10	4	444	374	7	1	382	12			12	1
EXPERIMT PSYCH	N	1315	24	50	1395	1196	13	34	1246	11			11	7
COMPARATIVE	N	92	1	4	97	84	1	4	89					1
PHYSIOLOGICAL	N	466	8	23	497	408	3	16	427	7		1	8	2
INDUST&PERSON.	N	260	7	23	292	241	5	15	261	2			2	1
PERSONALITY	N	224	2	8	235	194	2	5	201	7			7	1
PSYCHOMETRICS	N	80	5	7	92	68	2	5	75	1			1	
SOCIAL PSYCH	N	766	23	67	858	659	14	50	723	31	3		34	4
PSYCH, GEN	N	657	23	28	863	478	14	14	510	21		1	23	
PSYCH, OTHER	N	584	9	16	627	503	4	11	518	19			19	9
ARTS & HUM TOT	N	18148	857	925	20460	15580	533	494	16635	309	30	58	402	93
ART, APPLIED	N	16	1	1	20	11	1		12					
ART, HIST&CRIT	N	475	16	21	526	411	10	11	434	5	1		6	1
HIST, AMERICAN	N	1665	12	33	1719	1439	9	24	1475	48	1	1	50	15
HIST, EUROPEAN	N	1306	32	38	1381	1173	24	29	1228	4	2	1	7	
HISTORY, OTHER	N	1187	70	111	1451	929	22	41	994	27	5	19	53	6
HIST&PHIL/SCI	N	107	9	9	126	86	7	6	99	2		1	3	1
AMERICAN STUD.	N	145	1	3	151	133			133	7			7	2
MUSIC	N	1296	40	46	1456	1119	20	24	1166	30		2	32	4
SPCH AS DR ART	N	565	10	10	604	461	4	2	468	12		2	15	5
ARCHEOLOGY	N	76	2	8	86	70	2	7	79					2
RELIGION	N	618	33	33	703	569	15	12	596	11		3	14	2
PHILOSOPHY	N	1392	50	92	1578	1214	28	46	1288	10	4	6	20	7
LINGUISTICS	N	525	51	132	721	428	20	57	505	7	1	4	12	4
COMPARATVE LIT	N	127	13	16	157	116	10	9	135	2		3	5	
AMERICAN L&L	N	972	10	27	1010	859	8	12	879	23	1	2	26	8
ENGLISH L&L	N	3920	93	130	4277	3449	60	76	3594	57	5	4	67	23
GERMAN L&L	N	587	70	34	706	519	65	28	614	9			9	1
RUSSIAN L&L	N	209	10	12	232	193	9	10	212	1			1	
FRENCH L&L	N	863	122	30	1033	765	104	21	890	22	7	3	32	3
SPAN &PORT L&L	N	795	114	35	957	559	63	17	640	11	2	4	17	2
ITALIAN L&L	N	78	11	5	94	72	10	4	86					
CLASSICAL L&L	N	319	4	17	345	283	4	16	304	1			1	1
OTHER LANG.	N	332	43	41	445	260	15	21	296	2		1	3	3
ARTS & HUM,GEN	N	86	4	4	95	68	2	2	72	4			4	1
ARTS&HUM,OTHER	N	487	36	37	587	394	21	19	436	14	1	2	18	2

Appendix A - Part I continued

		TOTAL				WHITE				BLACK				AMER. INDIAN
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	TEMP.	TOTAL	U.S.	NON-U.S. PERM.	TEMP.	TOTAL	U.S.	NON-U.S. PERM.	TEMP.	TOTAL	TOTAL
PROF FLDS TOT	N	4722	265	614	5801	4058	115	332	4515	133	9	21	165	18
RELIGION &THEO	N	44	3	3	50	1			1					
THEOLOGY	N	587	22	48	696	555	11	24	591	12	1	1	14	2
BUSINESS ADMIN	N	2419	169	421	3106	2126	75	239	2443	30	7	12	50	6
HOME ECONOMICS	N	182	4	14	202	163	1	3	167	6			6	2
JOURNALISM	N	66	4	5	76	55	1		56	2		1	3	
SPEECH&HEARING	N	518	6	11	553	445	4	7	456	13			14	3
LAW, JURISPRUD	N	30	9	46	104	28	2	18	48		1	4	5	
SOCIAL WORK	N	456	21	27	517	315	8	14	339	56		3	59	2
LIB & ARCH SCI	N	216	14	13	245	182	4	9	196	9			9	2
PROF FLD,OTHER	N	204	13	26	252	188	9	18	216	5			5	1
EDUCATION TOT	N	27158	438	1280	29563	22006	205	575	22813	2119	36	96	2261	178
FOUNDTNS-S&P	N	926	36	92	1059	718	17	34	770	65	3	5	73	4
ED PSYCH	N	1759	42	70	1896	1494	19	34	1548	73	3	5	82	16
ELEMNT ED, GEN	N	1006	5	31	1052	816	2	11	830	72		1	73	6
SECONDY ED,GEN	N	785	7	32	831	640	5	10	655	50	1	2	53	9
HIGHER ED	N	2245	28	64	2348	1882	14	15	1913	213	2	5	221	17
ADULT ED(919)	N	552	10	43	608	480	7	15	502	36		6	42	3
ED MEAS & STAT	N	365	14	43	424	309	2	17	328	11	1	2	14	3
CURRIC & INSTR	N	2834	34	159	3052	2395	16	80	2495	254	3	13	270	19
EDUC ADMIN&SUP	N	5694	62	186	6009	4425	26	69	4526	604	9	16	631	40
GUIDANCE (940)	N	2625	25	57	2738	2185	15	29	2231	184	2	7	195	14
SPECIAL ED	N	1114	19	27	1176	910	12	15	938	59	2	1	63	15
AUDIO-VIS MED	N	329	14	24	371	277	5	15	299	11	2	1	14	1
AGRICULTURE	N	90	3	19	113	71	1	2	74	12		1	13	2
ART	N	196	4	10	217	154	2	6	162	12		1	13	1
BUSINESS	N	324	8	9	342	278	3	5	286	24		2	26	2
ENGLISH	N	334	8	16	364	257	4	8	269	31	1	2	34	2
FOREIGN LANG	N	93	6	13	114	72	2	1	75	5			5	2
HOME ECONOMICS	N	117	4	14	136	93	3	9	105	14			15	
INDUST ARTS	N	201	5	8	217	170		3	173	8			9	2
MATHEMATICS	N	414	4	19	443	327	2	7	336	25		1	26	
MUSIC	N	414	4	14	440	345	3	6	354	22		1	23	1
READING	N	109	2	1	112	99	2	1	102	6			6	
PHYS ED (988)	N	1213	31	132	1393	1014	22	107	1144	33		2	36	5
SCIENCE ED	N	456	11	41	519	342	2	13	357	32	1	3	36	2
SOCIAL SCI ED	N	222	2	8	235	170	1	4	175	13		1	14	
SPEECH ED	N	40		1	41	37		1	38	1			1	1
VOCATIONAL ED	N	648	8	15	672	553	2	2	557	38	1	3	42	4
OTHR TEACH FLD	N	459	5	18	490	355	2	10	367	24			24	1
EDUCATION, GEN	N	883	28	80	1378	615	11	30	660	113	5	10	128	3
ED, OTHER	N	711	9	34	773	523	3	16	544	74		5	79	3
OTHER/UNSP FLD	N	107	11	12	260	89	5	6	101	1	1		2	

Appendix A

Fine Field of Ph.D. by Citizenship and Racial/Ethnic Group for All Doctorate Recipients, 1973-1976 - Part II

		CHICANO				PUERTO RICAN	ASIAN				OTHER			UNKNOWN			TOTAL			
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	TEMP.	TOTAL	TOTAL	U.S.	NON-U.S. PERM.	TEMP.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S. PERM.	TEMP.	TOTAL
TOTAL ALL FLDS	N	845	92	297	1242	224	1165	2998	3989	8200	84	139	224	10065	4464	17863	108497	7026	13580	132673
PHYSCL SCI SBT	N	71	13	59	144	19	231	828	1066	2139	10	26	36	1434	867	2740	14614	1448	2854	19393
MATH SUBTOTAL	N	19	2	21	42	5	59	170	244	478	2	5	7	333	184	617	3420	282	777	4590
ALGEBRA	N	1	1	2	4		3	13	23	39		1	1	27	18	45	411	29	68	508
ANALYSIS (010)	N	6		3	9	2	12	26	44	82		1	1	52	29	82	604	40	127	773
GEOMETRY	N	1		1	2		2	5	10	17				12	5	17	84	10	25	119
LOGIC	N							1	3	4				13	5	18	107	2	15	124
NUMBER THEORY	N	1		2	3		2	2	5	9				6	6	12	87	3	17	107
PROB,MATH STAT	N	1		6	7		11	34	43	88		2	2	29	28	64	445	53	138	644
TOPOLOGY	N	1			1	1	4	13	15	32	1		1	36	8	44	331	16	45	393
COMPUTING THRY	N	3	1	5	9		7	31	31	70				46	20	81	563	55	105	740
OPERATIONS RES	N						1	4	7	12		1	1	7	2	11	80	8	28	118
APPLIED MATH	N	4			4	1	12	17	30	60				30	21	63	325	33	88	460
MATH, GEN	N	1		2	3		2	15	28	48	1		1	62	40	165	233	22	105	427
MATH, OTHER	N					1	3	9	5	17				13	2	15	150	11	16	177
PHYS EAST SUBT	N	20	2	15	37	5	72	208	352	634	4	11	15	432	319	879	3970	408	947	5458
ASTRONOMY	N						3	1	6	10				19	5	27	220	5	31	259
ASTROPHYSICS	N			1	1		5	3	12	20	1		1	30	6	38	241	6	37	286
ATOMIC & MOLEC	N	2			2	1	6	16	26	48		2	2	31	28	60	392	30	74	497
ELECTROMAG	N							4	2	6				2	2	4	32	7	4	43
MECHANICS	N								4	4				1	1	2	11	1	5	17
ACOUSTICS	N							1		1				1	1	2	45	2	2	49
FLUIDS	N	1			1		2	6	6	14				2	5	8	65	11	13	90
PLASMA PHYSICS	N	1	2	2	5		7	14	14	35		2	2	23	6	31	199	22	35	258
OPTICS	N	2			2		3	6	9	18				12	6	18	108	10	21	139
THERMAL PHYS	N							6	6	12				4	1	5	31	7	7	45
ELEMENT PART	N	2		2	4		9	20	34	64		3	3	42	35	79	448	45	124	620
NUCLEAR STRUCT	N	2		2	4	2	5	20	35	60	1	2	3	34	35	69	405	40	108	553
SOLID STATE	N	3		7	10	1	21	73	100	194	1	1	2	86	84	174	980	133	234	1351
PHYSICS, GEN	N	4		1	5		7	22	71	101	1	1	2	97	86	286	386	59	184	736
PHYSICS, OTHER	N	3			3	1	4	16	27	47				48	18	76	407	30	66	515
CHEMISTRY SUBT	N	28	7	10	46	6	91	385	391	872	2	8	10	485	255	908	5479	602	785	7050
ANALYTICAL CH	N	3			3	1	2	13	21	36		1	1	29	16	45	495	24	46	565
INORGANIC CHEM	N	6	1	1	8	2	10	30	31	71				74	17	92	816	43	57	917
ORGANIC CHEM	N	11	2	1	15	2	26	114	132	272		2	2	170	65	239	1936	176	236	2355
NUCLEAR CHEM	N							6	3	9				6	1	7	84	9	8	101
PHYSICAL CHEM	N	7	4	5	16	1	25	116	102	245	2	2	4	94	50	148	1240	155	189	1591
THEORETICAL CH	N						3	8	6	17				9	5	14	159	15	22	196
AGRICLT & FOOD	N			1	1		1	5	3	9				2	4	8	25	9	8	44
PHARMACEUTICAL	N	1			1		7	25	5	37		1	1	11	18	33	165	47	20	236
POLYMER CHEM	N			1	1		5	21	18	44				1	4	6	76	24	29	130
CHEMISTRY, GEN	N			1	1		10	30	49	92		1	1	77	63	290	304	66	136	666
CHEM, OTHER	N						2	17	21	40		1	1	12	12	26	179	34	34	249

Source: Survey of Earned Doctorates, National Research Council

Appendix A - Part II continued

		CHICANO				PUERTO RICAN	ASIAN				OTHER			UNKNOWN			TOTAL			
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL
EARTH SCI SUBT	N	4	2	13	19	3	9	65	79	155	2	2	4	184	109	336	1745	156	345	2295
MINERAL,PETROL	N	1		1	2		1	1	7	10		1	1	13	6	20	139	8	28	178
GEOCHEMISTRY	N	1			1			6	5	11	1		1	16	8	26	145	10	28	186
STRATIG, SEDIM	N			1	1				3	3				15	5	20	176	6	21	203
PALEONTOLOGY	N							1	1	2				15	2	17	155	5	7	168
STRUCTURAL GEO	N								1	1				5	1	6	66		8	74
GEOPHYSICS	N			2	2		1	18	20	39	1		1	17	15	37	182	29	55	272
GEOPHYSICS SE	N								3	3				3	2	6	28	2	9	40
GEOMORPH (350)	N													10	1	11	98	5	6	109
HYDROLOGY	N	1		1	2	1	1	3	4	9				6	5	12	56	8	14	80
OCEANOGRAPHY	N	1	1	1	3	2	4	7	8	19				37	8	50	288	22	29	344
METEOROLOGY	N						1	14	8	23		1	1	15	12	28	131	22	29	183
ATMOS PHY&CHEM	N							1	1	2				1		1	13	1	2	16
ATMOS DYNAMICS	N						1		1	2				1	1	2	11		3	14
ATMOS SCI,OTHR	N							3	2	5					2	3	13	3	6	23
APPL GEO (391)	N		1		1			3	6	9				6	5	11	64	7	27	98
FUEL TECH(395)	N			3	3			3	4	7					13	13	7	9	21	37
EARTH SCI, GEN	N			2	2			5	3	8				14	14	53	95	13	29	162
EARTH SCI,OTHR	N			2	2				2	2				10	9	20	78	6	23	108
ENGINRNG TOTAL	N	27	7	48	82	17	234	983	1014	2241	6	49	55	693	1155	2176	7078	1856	2928	12212
AERONAUT&ASTRO	N	1			1	1	9	20	32	71		4	4	42	41	90	394	66	111	578
AGRICULTRL ENG	N			2	2		1	10	12	23		1	1	9	32	46	127	17	71	220
BIOMEDICAL ENG	N			1	1		2	12	9	23				16	12	30	225	30	24	282
CIVIL ENG	N	1		6	7	2	31	113	143	287	1	6	7	68	175	308	562	220	439	1286
CHEMICAL ENG	N	7	1	10	18	4	25	162	158	347		7	7	79	170	279	778	268	401	1480
CERAMIC ENG	N							6	8	14				6	8	17	67	11	16	97
COMPUTER ENG	N			1	1		6	10	22	38		2	2	9	22	34	125	22	71	221
ELECTRICAL ENG	N	6	2	8	16		49	170	192	413	1	4	5	135	183	401	1393	313	520	2314
ELECTRONICS EN	N	1			1		7	32	25	64				20	27	47	227	53	73	353
INDUSTRIAL ENG	N	1		4	5		2	9	24	36				32	32	73	237	32	81	360
NUCLEAR ENG	N			3	3	2	6	24	36	67				29	34	68	306	51	98	463
ENGINEER. MECH	N	2		2	4	1	21	87	58	167		3	3	22	53	78	342	138	135	619
ENGINEER. PHYS	N						3	8	7	18				4	2	6	68	14	14	97
MECHANICAL ENG	N	4	1	2	7		35	122	83	240	1	11	12	82	142	245	825	229	293	1369
METALURGY(475)	N	2		3	5	1	4	35	52	92	2	1	3	34	63	104	280	76	142	507
SYS DESGN(476)	N		1	1	2	2	4	8	14	26		1	1	1	9	10	94	17	36	147
OPERATIONS RES	N		1	1	2	2	4	25	20	49		3	3	15	29	47	255	66	79	403
FUEL TECH(479)	N			1	1		1	4	4	9					6	15	13	12	22	56
SANITARY ENG	N					1	2	12	12	26		1	1	10	10	20	100	25	30	155
MINING ENG	N			1	1			4	2	6				1	5	7	9	8	9	27
MATERIALS SCI	N	1	1		2		8	54	49	113		3	3	30	48	101	270	87	116	498
ENG, GENERAL	N			1	1		4	11	11	26				11	18	58	79	24	39	173
ENG, OTHER	N	1		1	2	1	10	35	41	86	1	2	3	38	34	92	302	77	108	507
LIFE SCI TOTAL	N	95	12	128	235	29	251	631	881	1767	9	28	38	1392	884	2785	15426	1265	2762	19988
BIO SCI SUBT	N	75	9	47	131	17	187	349	444	981	8	11	19	1041	378	1768	10801	707	1215	13080
BIOCHEMISTRY	N	12	4	5	21	4	45	119	112	276	1	1	2	178	73	319	1963	200	239	2470
BIOPHYSICS	N	3		3	6		6	18	20	44		1	1	30	14	80	353	30	52	472
BIOMET,BIOSTAT	N	1		1	2		8	2	5	15				10	9	21	115	9	28	154
ANATOMY	N	1			1	1	5	12	5	22	1		1	41	4	65	445	21	15	501

Appendix A - Part II continued

		CHICANO				PUERTO RICAN	ASIAN				OTHER			UNKNOWN			TOTAL			
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL
CYTOLOGY	N	3			3		3	6	5	14				7	4	16	141	11	9	166
EMBRYOLOGY	N						4		4	8				8	1	9	83	1	7	91
IMMUNOLOGY	N	1			1	1	7	7	12	26	1		1	13	3	19	236	19	25	283
BOTANY	N	6	1	4	11		5	9	28	42		1	1	72	18	105	620	19	69	723
ECOLOGY	N	2		6	8	1	5	3	3	11	2	1	3	45	8	55	511	12	40	565
HYDROBIOLOGY	N													7		7	47	1	1	49
MICROBIO &BACT	N	14		2	16	2	26	45	45	116				111	55	202	1237	102	108	1486
ANIMAL PHYSIOL	N	6	1	3	10	1	12	20	28	60				101	32	145	1132	61	81	1287
PLANT PHYS	N	1		2	3			12	26	38				16	11	31	211	20	62	297
ZOOLOGY	N	2	1	5	6	1	8	4	10	22	1		1	118	25	168	1021	18	55	1119
GENETICS	N	4		4	8		12	16	30	58		2	2	27	24	65	401	28	109	552
ENTOMOLOGY	N	3	1	7	11	1	8	8	50	67	1	3	4	32	33	76	507	27	127	673
MOLECULAR BIO	N	2	1	1	4	2	8	20	15	43		1	1	38	15	56	479	35	46	563
NUTRITION/DIET	N	1			1		3	6	5	14				1	4	6	57	10	16	84
BIO SCI, GEN	N	8		4	12	1	9	12	15	36	1	1	2	102	21	186	607	32	54	756
BIO SCI, OTHER	N	5			5	2	13	30	26	69				84	24	137	635	51	72	787
AG SCI SUBT	N	10	3	68	81	5	19	152	362	535		12	13	175	382	596	2463	290	1250	4050
AGRONOMY	N	2		16	18	1	2	13	72	88		4	5	22	67	95	303	22	230	563
AG ECON	N	3	2	13	18		3	19	62	84		4	4	31	72	109	398	43	236	685
ANIMAL HUSBAND	N							1	2	3				11	6	17	72	3	15	90
FOOD SCI &TECH	N	2			2		3	48	48	99				15	36	53	195	79	118	395
FISH &WILDLIFE	N						1	6	6	13				18	12	31	188	11	20	220
FORESTRY	N			2	2		1	8	32	41				15	13	31	221	12	81	317
HORTICULTURE	N			1	1	1	2	4	30	36				9	24	34	134	12	74	222
SIOLS&SOIL SCI	N		1	11	12	1		9	32	41				19	46	69	178	27	148	358
ANIMAL SCI	N	1		11	12	1		22	33	55		2	2	7	31	47	319	39	131	498
PHYTOPATHOLOGY	N	1		8	9		7	13	27	47		2	2	10	30	46	243	24	133	376
AG. GENERAL	N							1	5	6					4	5	9	2	14	26
AG. OTHER	N	1		6	7	1		8	13	22				18	41	59	203	16	80	300
MED SCI SUBT	N	9		13	22	3	37	110	62	210	1	5	6	160	111	386	1797	231	252	2403
MED & SURGERY	N			1	1	1	1	3	2	6				1	4	5	13	4	7	24
PUBLIC HEALTH	N	3			3		9	6	10	26				24	12	67	332	23	39	430
VETERINARY MED	N	1		1	2			3	5	8		1	1	8	19	29	71	7	47	127
HOSPITAL ADMIN	N													2		2	19			19
PARASITOLOGY	N			1	1	1	3	2	2	7		1	1	1		1	69	5	6	82
PATHOLOGY	N	1		4	5		3	13	5	21		1	1	19	15	62	228	35	29	320
PHARMACOLOGY	N	1		3	4	1	11	31	15	57	1	1	2	46	17	96	564	56	54	707
PHARMACY	N	1			1		2	43	13	58		1	1	9	32	43	153	77	34	266
MED SCI, GEN	N	1			1			3	2	5				15	2	19	54	5	3	64
MED SCI, OTHER	N	1		3	4		8	6	8	22				35	10	62	294	19	33	364
ENVIRONM. SCI	N	1			1	4	8	20	13	41				16	13	35	365	37	45	455
SOCIAL SCI TOT	N	140	10	25	179	50	158	219	446	834	13	12	25	1951	701	3261	21244	886	2205	24996
ANTHROPOLOGY	N	12	1	4	17	2	9	8	16	33	2	1	3	155	31	232	1340	41	84	1516
COMMUNICATIONS	N	5		1	7	1		5	11	16				50	14	85	904	23	44	993
SOCIOLOGY	N	16	1	5	22	5	17	29	51	97				185	88	345	2182	122	277	2658
ECONOMICS	N	9	4	6	19	3	27	63	154	247		5	5	238	227	550	2425	220	729	3466
ECONOMETRICS	N			1	1			7	15	22		1	1	6	9	15	63	11	33	107

Appendix A - Part II continued

FIELD OF PH.D.		CHICANO U.S.	CHICANO NON-U.S. PERM.	CHICANO NON-U.S. TEMP.	CHICANO TOTAL	PUERTO RICAN TOTAL	ASIAN U.S.	ASIAN NON-U.S. PERM.	ASIAN NON-U.S. TEMP.	ASIAN TOTAL	OTHER U.S.	OTHER NON-U.S.	OTHER TOTAL	UNKNOWN U.S.	UNKNOWN NON-U.S.	UNKNOWN TOTAL	TOTAL U.S.	TOTAL NON-U.S. PERM.	TOTAL NON-U.S. TEMP.	TOTAL TOTAL
STATISTICS	N	1		1	2	1	3	8	25	36		2	2	8	16	36	92	17	58	180
GEOGRAPHY	N	1			1		6	3	11	20	1		1	48	28	97	599	33	99	753
AREA STUDIES	N	3			3		5	1	4	10				15	5	24	100	13	13	130
POL SCI,PUB AD	N	18		1	19	7	14	43	50	108	2	1	3	232	100	403	1920	112	236	2343
POLITICAL SCI	N	5	1		6	2	4	5	14	23				25	25	62	518	22	75	628
PUBLIC ADMIN	N	4		1	5			1	8	9				11	7	23	65	4	20	96
INTL RELATIONS	N	2			2		6	7	22	35	1	1	2	56	23	85	382	26	80	496
URBAN&REG PLAN	N	1		1	2		3	5	10	18	1		1	20	12	39	214	24	45	291
SOCIAL SCI,GEN	N	1			1		2		4	6				18	2	28	121	5	9	143
SOC SCI, OTHER	N	1		1	2		3	5	6	14	1	1	2	53	16	92	410	19	52	513
PSYCH SUBTOTAL	N	61	3	3	70	29	59	29	47	140	5		5	831	98	1145	9900	194	351	10663
CLINICAL PSYCH	N	19	1		20	11	18	2	2	22	1		1	213	15	249	3085	43	54	3209
COUNSEL & GUID	N	6			7	4	2	1	3	7	1		1	71	5	79	857	10	26	898
DEVEL &GERONT	N	4			4		6	3	1	10	1		1	48	16	72	630	15	28	681
ED PSYCH	N	6			6		2	3	3	8				42	8	62	456	14	13	495
SCHOOL PSYCH	N			1	1	1	1	1	1	3				39	3	44	428	10	4	444
EXPERIMT PSYCH	N	5			6	1	6	7	6	19				89	14	105	1315	24	50	1395
COMPARATIVE	N					1								6		6	92	1	4	97
PHYSIOLOGICAL	N	6			6	3	4	2	4	10				36	5	41	466	8	23	497
INDUST&PERSON.	N	1			1	2	2	1	4	8				11	5	17	260	7	23	292
PERSONALITY	N	2			2		2		2	5	1		1	17	1	18	224	2	8	235
PSYCHOMETRICS	N	2			2	1		2	1	3				8	2	10	80	5	7	92
SOCIAL PSYCH	N	1			1	2	12	3	10	25				57	10	69	766	23	67	858
PSYCH, GEN	N	2	1	1	4	3	2	3	7	14				151	10	309	657	23	28	863
PSYCH, OTHER	N	7	1	1	10		2	1	3	6	1		1	43	4	64	584	9	16	627
ARTS & HUM TOT	N	209	38	17	266	33	110	139	167	423	21	8	29	1794	298	2579	18148	857	925	20460
ART, APPLIED	N								1	1				5		7	16	1	1	20
ART, HIST&CRIT	N	3	1		4		2	1	6	10				53	7	71	475	16	21	526
HIST, AMERICAN	N	8			8		5		4	9				150	6	162	1665	12	33	1719
HIST, EUROPEAN	N	7			7	2	4	2	2	8				116	10	129	1306	32	38	1381
HISTORY, OTHER	N	16		1	17	5	17	32	26	77	1		1	186	35	298	1187	70	111	1451
HIST&PHIL/SCI	N						2	1	1	5				16	2	18	107	9	9	126
AMERICAN STUD.	N								3	3		1	1	3		5	145	1	3	151
MUSIC	N	7	1		8		10	14	10	34				126	15	212	1296	40	46	1456
SPCH AS DR ART	N	2			2		1	5	2	8	1		1	83	5	105	565	10	10	604
ARCHEOLOGY	N													4	1	5	76	2	8	86
RELIGION	N	1			1	1	9	14	11	36				25	11	53	618	33	33	703
PHILOSOPHY	N	6		4	10	2	8	10	24	42		1	1	145	19	208	1392	50	92	1578
LINGUISTICS	N	4	1	3	8		4	17	36	57		2	2	78	42	133	525	51	132	721
COMPARATVE LIT	N	1		1	2		4	1	1	6				4	4	9	127	13	16	157
AMERICAN L&L	N	3			3		1		6	7	6		6	72	8	81	972	10	27	1010
ENGLISH L&L	N	12	1	2	16	1	22	12	15	49	4	3	7	353	45	520	3920	93	130	4277
GERMAN L&L	N						1	1		2	1		1	56	10	79	587	70	34	706
RUSSIAN L&L	N											1	1	15	2	18	209	10	12	232
FRENCH L&L	N	2			2		6			6	5		5	60	17	95	863	122	30	1033
SPAN &PORT L&L	N	123	34	5	163	21	1		2	3	3		3	75	22	108	795	114	35	957
ITALIAN L&L	N													6	2	8	78	11	5	94
CLASSICAL L&L	N	2			2									32	1	37	319	4	17	345
OTHER LANG.	N	5			5		9	22	9	41				53	16	97	332	43	41	445
ARTS & HUM,GEN	N	2			2			2	1	3				11	1	13	86	4	4	95
ARTS&HUM,OTHER	N	5		1	6	1	4	5	7	16				67	17	108	487	36	37	587

Appendix A - Part II continued

FIELD OF PH.D.		CHICANO U.S.	CHICANO NON-U.S. PERM.	CHICANO NON-U.S. TEMP.	CHICANO TOTAL	PUERTO RICAN TOTAL	ASIAN U.S.	ASIAN NON-U.S. PERM.	ASIAN NON-U.S. TEMP.	ASIAN TOTAL	OTHER U.S.	OTHER NON-U.S.	OTHER TOTAL	UNKNOWN U.S.	UNKNOWN NON-U.S.	UNKNOWN TOTAL	TOTAL U.S.	TOTAL NON-U.S. PERM.	TOTAL NON-U.S. TEMP.	TOTAL TOTAL
PROF FLDS TOT	N	27	2	4	33	10	43	76	98	218	3	9	12	430	213	830	4722	265	614	5801
RELIGION &THEO	N													43	6	49	44	3	3	50
THEOLOGY	N	1	2		3	1	3	6	15	24		1	1	13	9	60	587	22	48	696
BUSINESS ADMIN	N	12		4	16	2	23	47	60	130	1	5	6	219	141	453	2419	169	421	3106
HOME ECONOMICS	N						2	2	5	9				9	7	18	182	4	14	202
JOURNALISM	N	1			1			1	1	2				8	5	14	66	4	5	76
SPEECH&HEARING	N	1			1	1	3	2	3	8	2		2	50	1	66	518	6	11	553
LAW, JURISPRUD	N							4	8	13				2	18	38	30	9	46	104
SOCIAL WORK	N	10			10	6	8	4	3	15		2	2	59	14	84	456	21	27	517
LIB & ARCH SCI	N	1			1		4	7		11				18	7	26	216	14	13	245
PROF FLD,OTHER	N	1			1			3	3	6		1	1	9	5	22	204	13	26	252
EDUCATION TOT	N	275	10	16	302	66	136	119	312	568	22	7	29	2357	341	3346	27158	438	1280	29563
FOUNDTNS-S&P	N	11		3	14	5	10	11	28	49	1		1	112	27	143	926	36	92	1059
ED PSYCH	N	8	2	1	11	4	17	14	20	51	1		1	146	14	183	1759	42	70	1896
ELEMNT ED, GEN	N	5			5		9	2	10	21				98	10	117	1006	5	31	1052
SECONDY ED,GEN	N	5			5	2	1	1	14	16				78	6	91	785	7	32	831
HIGHER ED	N	23		2	26	13	4	7	21	32	1		1	92	26	125	2245	28	64	2348
ADULT ED(919)	N	8		1	9	2	1	2	12	15	2		2	20	10	33	552	10	43	608
ED MEAS & STAT	N	2			2		4	8	14	27		1	1	36	12	49	365	14	43	424
CURRIC & INSTR	N	42	1		43	6	17	9	37	63	3	1	4	98	33	152	2834	34	159	3052
EDUC ADMIN&SUP	N	93	2	3	98	9	18	18	48	84	3	1	4	502	56	617	5694	62	186	6009
GUIDANCE (940)	N	28		3	31	4	7	6	8	21				203	12	242	2625	25	57	2738
SPECIAL ED	N	13	1		14	1	6	2	7	15	1	1	2	109	5	128	1114	19	27	1176
AUDIO-VIS MED	N	1	1		2	1	5	5	4	14				33	5	40	329	14	24	371
AGRICULTURE	N					1			8	8		1	1	4	9	14	90	3	19	113
ART	N	1			1		1	2		3				27	3	37	196	4	10	217
BUSINESS	N		1		1		1	1	1	3		1	1	19	3	23	324	8	9	342
ENGLISH	N	1			1	1	1	2	2	5	2		2	39	5	50	334	8	16	364
FOREIGN LANG	N	1			1	3			4	4				11	11	24	93	6	13	114
HOME ECONOMICS	N								4	4				10	2	12	117	4	14	136
INDUST ARTS	N					2	3	3	2	8				16	5	23	201	5	8	217
MATHEMATICS	N	2		1	3	1	3	1	2	6	1		1	55	9	70	414	4	19	443
MUSIC	N	1			1		4	1	4	9	1		1	40	3	51	414	4	14	440
READING	N	1			1		1			1				2		2	109	2	1	112
PHYS ED (988)	N	5			5	2	4	6	10	20	2		2	148	16	179	1213	31	132	1393
SCIENCE ED	N	1	1	1	3	2	1	3	16	20				76	12	99	456	11	41	519
SOCIAL SCI ED	N	2			2	1	2	1	2	5				34	1	38	222	2	8	235
SPEECH ED	N													1		1	40		1	41
VOCATIONAL ED	N	3			3		1	4	7	12				49	4	54	648	8	15	672
OTHR TEACH FLD	N					1	3	1	6	10	1		1	74	4	86	459	5	18	490
EDUCATION, GEN	N	11			11	3	7	6	15	28	1		1	130	31	544	883	28	80	1378
ED, OTHER	N	7	1	1	9	2	5	3	6	14	2	1	3	95	7	119	711	9	34	773
OTHER/UNSP FLD	N	1			1		2	3	3	10				14	5	146	107	11	12	260

APPENDIX B

FINE FIELD OF PH.D. BY CITIZENSHIP AND BY RACIAL/ETHNIC GROUP FOR WOMEN DOCTORATE RECIPIENTS, 1973-1976

Appendix B

Fine Field of Ph.D. by Citizenship and Racial/Ethnic Group for Women Doctorate Recipients, 1973-1976 - Part I[1/]

		TOTAL				WHITE				BLACK				AMER. INDIAN
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
TOTAL ALL FLDS	N	24093	1165	1411	27412	20387	567	618	21610	1202	19	35	1260	114
PHYSCL SCI SBT	N	1101	177	240	1558	968	40	77	1085	14	1		15	4
MATH SUBTOTAL	N	353	28	69	456	314	9	28	351	5			5	
ALGEBRA	N	73	9	11	93	70	3	6	79	1			1	
ANALYSIS (C10)	N	56	3	10	69	50	1	4	55					
GEOMETRY	N	11		3	14	8		2	10					
LOGIC	N	10	1	1	12	10	1	1	12					
NUMBER THECRY	N	7		4	11	7			7					
PROB,MATH STAT	N	54	3	10	67	45		5	50	1			1	
TOPOLOGY	N	31	2	6	39	29	1	3	33	1			1	
COMPUTING THRY	N	49	2	5	56	46	2	1	49					
OPERATIONS RES	N	3	1	1	5	2		1	3	1			1	
APPLIED MATH	N	14	2	3	19	10			10					
MATH, GEN	N	27	1	12	46	23		4	27	1			1	
MATH, OTHER	N	18	4	3	25	14	1	1	16					
PHYS &AST SUBT	N	135	35	59	237	117	7	17	141	3			3	1
ASTRONOMY	N	21		3	24	20		3	23					
ASTROPHYSICS	N	7		3	11	5		2	7					
ATOMIC & MOLEC	N	9	1	4	14	7	1	2	10					
ELECTROMAG	N	1	1		2	1	1		2					
MECHANICS	N	1		1	2	1			1					
ACOUSTICS	N	2			2	2			2					
FLUIDS	N	1	1	1	3	1			1					
PLASMA PHYSICS	N	4		1	5	3		1	4					1
OPTICS	N	3		1	4	3			3					
THERMAL PHYS	N	1	2		3									
ELEMENT PART	N	20	3	3	26	18	1	1	20	1			1	
NUCLEAR STRUCT	N	10	4	5	19	9		3	12					
SOLID STATE	N	32	13	17	62	28	2	2	32	1			1	
PHYSICS, GEN	N	13	4	15	39	11		1	12					
PHYSICS, OTHER	N	10	6	5	21	8	2	2	12	1			1	
CHEMISTRY SUBT	N	511	103	103	738	447	18	24	489	6	1		7	2
ANALYTICAL CH	N	28	1	8	37	24		1	25	1			1	1
INORGANIC CHEM	N	106	5	8	119	91	1	2	94	1			1	
ORGANIC CHEM	N	127	25	28	180	111	4	5	120					
NUCLEAR CHEM	N	5			5	5			5					
PHYSICAL CHEM	N	148	34	23	205	135	8	5	148	1	1		2	1
THEORETICAL CH	N	19	4	4	27	17	2	3	22	1			1	
AGRICLT & FOOD	N	4	1	1	6	2			2	1			1	
PHARMACEUTICAL	N	15	9	6	30	14		2	16					
POLYMER CHEM	N	5	2		7	3			3					
CHEMISTRY, GEN	N	28	12	19	79	21	2	6	29	1			1	
CHEM, OTHER	N	26	10	6	43	24	1		25					

1/ See page 167 for additional racial/ethnic groups.

Source: Survey of Earned Doctorates, National Research Council

Appendix B - Part I continued

FIELD OF PH.D.		TOTAL				WHITE				BLACK				AMER. INDIAN
		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
EARTH SCI SUBT	N	102	11	9	127	90	6	8	104					1
MINERAL,PETROL	N	5	1		6	4			4					
GEOCHEMISTRY	N	10			10	9			9					
STRATIG, SEDIM	N	10		1	11	9		1	10					
PALEONTOLOGY	N	21			21	19			19					1
STRUCTURAL GEO	N	3			3	1			1					
GEOPHYSICS	N	6	1	1	9	6	1	1	8					
GEOPHYSICS SE	N	1			2									
GEOMORPH (350)	N	4		1	5	4		1	5					
HYDROLOGY	N	1			1	1			1					
OCEANOGRAPHY	N	23	2	3	29	22	2	2	26					
METEOROLOGY	N	5	1		6	5			5					
ATMOS PHY&CHEM	N	2		1	3	2		1	3					
ATMOS SCI,OTHR	N	1	3		4	1			1					
APPL GEO (391)	N	1			1	1			1					
FUEL TECH(395)	N		1	1	2		1	1	2					
EARTH SCI, GEN	N	4		1	7	3		1	4					
EARTH SCI,OTHR	N	5	2		7	3	2		5					
ENGINRNG TOTAL	N	102	28	47	180	92	9	23	124					
AERONAUT&ASTRO	N	3	3	1	7	2	2		4					
AGRICULTRL ENG	N		1	1	2									
BIOMEDICAL ENG	N	8	1		9	8	1		9					
CIVIL ENG	N	6	5	5	16	6	2	5	13					
CHEMICAL ENG	N	13	1	9	23	11		5	16					
CERAMIC ENG	N	2		1	3	2		1	3					
COMPUTER ENG	N	13		2	15	13		1	14					
ELECTRICAL ENG	N	11	2	11	25	10	1	3	14					
ELECTRONICS EN	N			1	1									
INDUSTRIAL ENG	N	6		1	7	5			5					
NUCLEAR ENG	N	3	2	2	7	3	1		4					
ENGINEER. MECH	N	2	2	5	9	1		3	4					
ENGINEER. PHYS	N	1	1		2									
MECHANICAL ENG	N	9	3	1	13	8	1	1	10					
METALURGY(475)	N	5		1	6	5			5					
SYS DESGN(476)	N		1		1									
OPERATIONS RES	N	7			7	6			6					
FUEL TECH(479)	N			1	1			1	1					
SANITARY ENG	N	1	1		2	1			1					
MATERIALS SCI	N	5	4	4	14	4	1	2	7					
ENG, OTHER	N	7	1	1	10	7		1	8					
LIFE SCI TOTAL	N	2997	291	283	3675	2597	90	89	2777	77	5	6	88	12
BIO SCI SUBT	N	2439	206	211	2935	2105	62	68	2236	60	4	5	69	11
BIOCHEMISTRY	N	433	65	55	566	376	18	14	408	7		2	9	2
BIOPHYSICS	N	39	5	7	54	34		1	35	1			1	
BIOMET,BIOSTAT	N	26	2	1	30	24	1		25					
ANATOMY	N	100	5	6	115	89	2	5	96					1

Appendix B - Part I continued

FIELD OF PH.D.		TOTAL				WHITE				BLACK				AMER. INDIAN
		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
CYTOLOGY	N	46	7	2	57	40	1	1	42	1			1	
EMBRYOLOGY	N	27			27	24			24					
IMMUNOLOGY	N	71	6	3	80	63	3	1	67	3	1		4	
BOTANY	N	124	8	13	150	103	2	5	110	4			4	
ECOLOGY	N	66	1	1	70	58		1	59	3			3	
HYDROBIOLOGY	N	3		1	4	3		1	4					
MICROBIO &BACT	N	335	25	13	389	288	11	1	301	11	1	1	13	4
ANIMAL PHYSIOL	N	213	10	10	234	198	5	4	207	2			2	
PLANT PHYS	N	37	11	7	56	33	3	2	38	1			1	
ZOOLOGY	N	201	5	6	216	172	1	3	176	5	1		6	1
GENETICS	N	126	7	13	148	107	3	5	115	6	1		7	1
ENTOMOLOGY	N	27	3	11	45	25		2	27	1		1	2	
MOLECULAR BIO	N	153	9	10	172	134	3	5	142	5			5	
NUTRITION/DIET	N	32	5	6	43	29	1	4	34	1			1	
BIO SCI, GEN	N	171	9	16	212	135	2	5	142	3			3	
BIO SCI, OTHER	N	209	23	30	267	170	6	8	184	6		1	7	2
AG SCI SUBT	N	102	32	46	183	89	7	12	108	2		1	3	1
AGRONOMY	N	1	3	5	9	1		1	2			1	1	
AG ECON	N	8	4	5	18	4	1		5					1
ANIMAL HUSBAND	N	1		1	2	1			1					
FOOD SCI &TECH	N	39	11	17	67	33	2	6	41	1			1	
FISH &WILDLIFE	N	5	2		7	5	1		6					
FORESTRY	N	2			2	2			2					
HORTICULTURE	N	5	1	3	9	5		1	6					
SIOLS&SOIL SCI	N	2	1	2	5	2		1	3					
ANIMAL SCI	N	19	3	7	30	19	1	1	21					
PHYTOPATHOLOGY	N	15	4	3	23	12	1	1	14	1			1	
AG, GENERAL	N	1			1	1			1					
AG, OTHER	N	4	3	3	10	4	1	1	6					
MED SCI SUBT	N	414	50	24	509	366	19	8	393	12	1		13	
PUBLIC HEALTH	N	118	12	5	144	103	7	1	111	8			8	
VETERINARY MED	N	6	1	1	8	6	1	1	8					
PARASITOLOGY	N	13		1	14	11		1	12					
PATHOLOGY	N	37	7		45	34	4		38	1			1	
PHARMACOLOGY	N	89	13	4	111	81	3	1	85	1	1		2	
PHARMACY	N	8	10	6	24	7	1		8	1			1	
MED SCI, GEN	N	12	1		14	8			8					
MED SCI, OTHER	N	131	6	7	149	116	3	4	123	1			1	
ENVIRONM. SCI	N	42	3	2	48	37	2	1	40	3			3	
SOCIAL SCI TOT	N	5399	184	283	6023	4738	109	154	5011	159	3	8	170	23
ANTHROPOLOGY	N	462	14	25	515	401	9	14	426	9	1	1	11	3
COMMUNICATIONS	N	243	5	9	267	213	3	5	221	16			16	1
SOCIOLOGY	N	666	36	52	772	587	23	32	644	29		2	31	3
ECONOMICS	N	246	16	38	307	220	8	17	245	3		2	5	
ECONOMETRICS	N	2	1	1	4	2	1		3					

Appendix B - Part I continued

		TOTAL				WHITE				BLACK				AMER. INDIAN
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
STATISTICS	N	7	3	8	19	5		3	8					
GEOGRAPHY	N	44	4	7	56	38	3	5	46	1			1	
AREA STUDIES	N	23	3	1	27	18	1		19		1		1	
POL SCI,PUB AD	N	298	11	16	338	268	3	7	278	4		1	5	2
POLITICAL SCI	N	99	4	2	106	88	2	1	91	4	1		5	1
PUBLIC ADMIN	N	10	1		11	6	1		7					
INTL RELATIONS	N	55	4	6	67	48	3	1	53					1
URBAN&REG PLAN	N	30		3	34	27		3	30	1			1	
SOCIAL SCI,GEN	N	33	3	1	39	30	2	1	33	1			1	
SOC SCI, OTHER	N	108	5	5	124	92	3	3	98	2			2	1
PSYCH SUBTOTAL	N	3073	74	109	3337	2695	47	62	2809	89		2	91	11
CLINICAL PSYCH	N	951	14	20	988	855	10	14	881	21		1	22	2
COUNSEL & GUID	N	266	4	11	283	225	2	6	233	13		1	14	2
DEVEL &GERONT	N	327	11	17	361	290	7	9	306	6			6	
ED PSYCH	N	144	11	5	163	129	6	3	138	5			5	
SCHOOL PSYCH	N	179	5	2	187	151	4	1	156	7			7	
EXPERIMT PSYCH	N	329	8	7	345	305	4	5	315	3			3	
COMPARATIVE	N	22		1	23	22		1	23					
PHYSIOLOGICAL	N	131	3	5	139	119	2	2	123	2			2	
INDUS&PERSON.	N	27	1	5	33	26	1	1	28					
PERSONALITY	N	75	1	2	79	69	1	1	71	1			1	1
PSYCHOMETRICS	N	13	1	1	15	11			11					
SOCIAL PSYCH	N	215	6	19	240	176	5	14	195	14			14	1
PSYCH, GEN	N	205	5	10	279	150	3	4	159	10			10	
PSYCH, OTHER	N	189	4	4	202	167	2	1	170	7			7	5
ARTS & HUM TOT	N	5756	335	226	6483	4984	242	129	5370	111	4	8	123	28
ART, APPLIED	N	3		1	4	3			3					
ART, HIST&CRIT	N	249	5	7	268	218	4	5	229	1			1	
HIST, AMERICAN	N	288	2	3	296	255	1	3	260	13	1		14	4
HIST, EUROPEAN	N	267	6	7	281	249	5	5	260					
HISTORY, OTHER	N	245	11	14	280	191	6	6	203	7	1		8	
HIST&PHIL/SCI	N	32	5	2	39	29	4	2	35					
AMERICAN STUD.	N	40			40	35			35	2			2	2
MUSIC	N	276	9	10	308	234	2	4	241	6			6	1
SPCH AS DR ART	N	157	1	2	165	124			124	8			8	3
ARCHEOLOGY	N	36	1	3	40	33	1	3	37					
RELIGION	N	58	2	1	62	55	1		56					
PHILOSOPHY	N	226	8	9	247	203	6	5	214	1			1	1
LINGUISTICS	N	202	23	42	275	169	10	23	202	2		2	4	1
COMPARATVE LIT	N	73	9	7	90	68	8	5	81	1			1	
AMERICAN L&L	N	356	2	10	369	319	2	3	324	12			12	2
ENGLISH L&L	N	1556	44	38	1702	1373	28	20	1428	29	1	1	31	8
GERMAN L&L	N	252	49	12	323	226	44	11	282	2			2	
RUSSIAN L&L	N	87	7	5	100	81	6	3	90					
FRENCH L&L	N	516	80	16	622	462	72	11	545	11		1	12	1
SPAN &PORT L&L	N	339	40	11	396	249	25	5	280	6	1	3	10	1
ITALIAN L&L	N	32	1		33	29	1		30					
CLASSICAL L&L	N	112	2	4	119	102	2	4	108					
OTHER LANG.	N	110	9	10	137	77	2	4	83	1			1	3
ARTS & HUM,GEN	N	33	1	1	35	22	1	1	24	3			3	
ARTS&HUM,OTHER	N	211	18	11	252	178	11	6	196	6		1	7	1

Appendix B - Part I continued

FIELD OF PH.D.		TOTAL				WHITE				BLACK				AMER. INDIAN
		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL
PROF FLDS TOT	N	791	28	48	890	648	16	24	690	54			55	5
RELIGION &THEO	N	2	1		3									
THEOLOGY	N	48	2	4	56	47	2	3	52	1			1	
BUSINESS ADMIN	N	104	5	12	125	87	3	7	97	4			4	
HOME ECONOMICS	N	154	4	14	174	137	1	3	141	6			6	2
JOURNALISM	N	7		1	8	4			4	2			2	
SPEECH&HEARING	N	179	3	2	192	153	3	1	157	8			9	1
LAW, JURISPRUD	N		2	2	5		1		1					
SOCIAL WORK	N	164	4	8	179	109	2	5	117	27			27	
LIB & ARCH SCI	N	85	4	2	91	66	2	2	70	6			6	2
PROF FLD,OTHER	N	48	3	3	57	45	2	3	51					
EDUCATION TOT	N	7924	121	283	8552	6337	60	121	6527	787	6	13	809	42
FOUNDTNS-S&P	N	259	10	19	290	204	4	10	218	26			26	
ED PSYCH	N	693	16	18	735	598	10	10	618	32	1		34	2
ELEMNT ED, GEN	N	571	3	17	597	443		5	449	56			56	3
SECONDY ED,GEN	N	195	2	10	210	159	1	1	161	18	1		19	1
HIGHER ED	N	497	13	12	526	404	5	2	412	57	1		59	3
ADULT ED(919)	N	135	2	6	143	113	1	3	117	10		1	11	1
ED MEAS & STAT	N	105	1	7	113	90		3	93	5			5	
CURRIC & INSTR	N	1048	8	44	1106	860	3	17	881	117		5	122	10
EDUC ADMIN&SUP	N	821	8	17	858	582	5	3	591	166		2	168	2
GUIDANCE (940)	N	787	7	13	815	650	4	7	662	69		3	72	4
SPECIAL ED	N	449	11	7	471	365	6	4	376	31	1		32	3
AUDIO-VIS MED	N	57	4	1	63	43	2		46	5			5	1
AGRICULTURE	N			1	1									
ART	N	77	2	5	88	66		5	71	3			3	1
BUSINESS	N	116	1	2	119	82		2	84	19			19	2
ENGLISH	N	156	6	5	172	113	3	3	119	23	1		24	1
FOREIGN LANG	N	45	1	7	53	35		1	36	4			4	1
HOME ECONOMICS	N	114	4	13	132	90	3	8	101	14			15	
INDUST ARTS	N	2			2	2			2					
MATHEMATICS	N	103		4	108	87		3	90	7			7	
MUSIC	N	100	1	4	107	78	1	1	80	10			10	1
READING	N	86	1	1	88	77	1	1	79	5			5	
PHYS ED (988)	N	384	7	17	411	335	6	11	352	5			5	2
SCIENCE ED	N	73	1	10	88	57		2	59	5			5	
SOCIAL SCI ED	N	50		1	52	41			41	3			3	
SPEECH ED	N	12		1	13	10		1	11	1			1	1
VOCATIONAL ED	N	117		2	119	105		1	106	7			7	
OTHR TEACH FLD	N	256	3	10	273	195	1	5	201	17			17	
EDUCATION, GEN	N	291	9	18	456	210	4	8	224	35	1	2	38	2
ED, OTHER	N	325		11	343	243		4	247	37			37	1
OTHER/UNSP FLD	N	23	1	1	51	23	1	1	26					

Appendix B

Fine Field of Ph.D. by Citizenship and Racial/Ethnic Group for Women Doctorate Recipients, 1973-1976 - Part II

FIELD OF PH.D.		CHICANO U.S.	CHICANO NON-U.S. PERM.	CHICANO NON-U.S. TEMP.	CHICANO TOTAL	PUERTO RICAN TOTAL	ASIAN U.S.	ASIAN NON-U.S. PERM.	ASIAN NON-U.S. TEMP.	ASIAN TOTAL	OTHER U.S.	OTHER NON-U.S.	OTHER TOTAL	UNKNOWN U.S.	UNKNOWN NON-U.S.	UNKNOWN TOTAL	TOTAL U.S.	TOTAL NON-U.S. PERM.	TOTAL NON-U.S. TEMP.	TOTAL TOTAL
TOTAL ALL FLDS	N	172	16	20	209	65	274	386	465	1133	28	11	39	1851	439	2982	24093	1165	1411	27412
PHYSCL SCI SBT	N	1	1	3	5	2	36	112	119	267	1	2	3	75	62	177	1101	177	240	1558
MATH SUBTOTAL	N	1		1	2		12	13	32	57	1	1	2	20	13	39	353	28	69	456
ALGEBRA	N							3	4	7		1	1	2	3	5	73	9	11	93
ANALYSIS (010)	N						2	2	5	9				4	1	5	56	3	10	69
GEOMETRY	N								1	1				3		3	11		3	14
LOGIC	N																10	1	1	12
NUMBER THEORY	N			1	1				2	2					1	1	7		4	11
PROB,MATH STAT	N						6	2	5	13				2	1	3	54	3	10	67
TOPOLOGY	N							1	2	3	1		1		1	1	31	2	6	39
COMPUTING THRY	N						1		4	5				2		2	49	2	5	56
OPERATIONS RES	N														1	1	3	1	1	5
APPLIED MATH	N	1			1		1	1	3	5				2	1	3	14	2	3	19
MATH, GEN	N						1	1	4	6				2	4	12	27	1	12	46
MATH, OTHER	N						1	3	2	6				3		3	18	4	3	25
PHYS &AST SUBT	N			1	1		2	24	26	52				12	19	39	135	35	59	237
ASTRONOMY	N													1		1	21		3	24
ASTROPHYSICS	N								1	1				2		3	7		3	11
ATOMIC & MOLEC	N													2	2	4	9	1	4	14
ELECTROMAG	N																1	1		2
MECHANICS	N								1	1							1		1	2
ACOUSTICS	N																2			2
FLUIDS	N							1	1	2							1	1	1	3
PLASMA PHYSICS	N																4		1	5
OPTICS	N								1	1							3		1	4
THERMAL PHYS	N							2		2				1		1	1	2		3
ELEMENT PART	N							1	2	3				1	1	2	20	3	3	26
NUCLEAR STRUCT	N						1	4	2	7							10	4	5	19
SOLID STATE	N			1	1			8	9	17				3	8	11	32	13	17	62
PHYSICS, GEN	N						1	4	6	11				1	8	16	13	4	15	39
PHYSICS, OTHER	N							4	3	7				1		1	10	6	5	21
CHEMISTRY SUBT	N		1	1	2	2	22	70	60	152		1	1	32	30	83	511	103	103	738
ANALYTICAL CH	N					1		1	5	6				1	2	3	28	1	8	37
INORGANIC CHEM	N					1	2	4	4	10				11	2	13	106	5	8	119
ORGANIC CHEM	N						6	18	17	41				10	9	15	127	25	28	180
NUCLEAR CHEM	N																5			5
PHYSICAL CHEM	N		1	1	2		6	21	15	42				5	5	10	148	34	23	205
THEORETICAL CH	N						1	2	1	4							19	4	4	27
AGRICLT & FOOD	N						1	1	1	3							4	1	1	6
PHARMACEUTICAL	N						1	7	3	11		1	1		2	2	15	9	6	30
POLYMER CHEM	N						2	2		4							5	2		7
CHEMISTRY, GEN	N						3	7	8	18				3	8	31	28	12	19	79
CHEM, OTHER	N							7	6	13				2	2	5	26	10	6	43

Source: Survey of Earned Doctorates, National Research Council

FIELD OF PH.D.		CHICANO U.S.	CHICANO NON-U.S. PERM.	CHICANO NON-U.S. TEMP.	CHICANO TOTAL	PUERTO RICAN TOTAL	ASIAN U.S.	ASIAN NON-U.S. PERM.	ASIAN NON-U.S. TEMP.	ASIAN TOTAL	OTHER U.S.	OTHER NON-U.S.	OTHER TOTAL	UNKNOWN U.S.	UNKNOWN NON-U.S.	UNKNOWN TOTAL	TOTAL U.S.	TOTAL NON-U.S. PERM.	TOTAL NON-U.S. TEMP.	TOTAL
EARTH SCI SUBT	N							5	1	6				11		16	102	11	9	127
MINERAL,PETROL	N							1		1				1		1	5	1		6
GEOCHEMISTRY	N													1		1	10			10
STRATIG, SEDIM	N													1		1	10		1	11
PALEONTOLOGY	N													1		1	21			21
STRUCTURAL GEO	N													2		2	3			3
GEOPHYSICS	N															1	6	1	1	9
GEOPHYSICS SE	N													1		2	1			2
GEOMORPH (350)	N																4		1	5
HYDROLOGY	N																1			1
OCEANOGRAPHY	N								1	1				1		2	23	2	3	29
METEOROLOGY	N							1		1							5	1		6
ATMOS PHY&CHEM	N																2		1	3
ATMOS SCI,OTHR	N							3		3							1	3		4
APPL GEO (391)	N																1			1
FUEL TECH(395)	N																	1	1	2
EARTH SCI, GEN	N													1		3	4		1	7
EARTH SCI,OTHR	N													2		2	5	2		7
ENGINRNG TOTAL	N						6	11	10	28				4	22	28	102	28	47	180
AERONAUT&ASTRO	N								1	1				1	1	2	3	3	1	7
AGRICULTRL ENG	N														2	2		1	1	2
BIOMEDICAL ENG	N																8	1		9
CIVIL ENG	N							1		1					2	2	6	5	5	16
CHEMICAL ENG	N						1		1	2				1	4	5	13	1	9	23
CERAMIC ENG	N																2		1	3
COMPUTER ENG	N								1	1							13		2	15
ELECTRICAL ENG	N						1	1	3	5					5	6	11	2	11	25
ELECTRONICS EN	N														1	1			1	1
INDUSTRIAL ENG	N								1	1				1		1	6		1	7
NUCLEAR ENG	N								2	2					1	1	3	2	2	7
ENGINEER. MECH	N							1	1	2				1	2	3	2	2	5	9
ENGINEER. PHYS	N						1	1		2							1	1		2
MECHANICAL ENG	N						1	2		3							9	3	1	13
METALURGY(475)	N														1	1	5		1	6
SYS DESGN(476)	N							1		1								1		1
OPERATIONS RES	N						1			1							7			7
FUEL TECH(479)	N																		1	1
SANITARY ENG	N							1		1							1	1		2
MATERIALS SCI	N						1	3		5					2	2	5	4	4	14
ENG, OTHER	N														1	2	7	1	1	10
LIFE SCI TOTAL	N	12	2	6	20	4	70	155	131	357	1	3	4	224	87	413	2997	291	283	3675
BIO SCI SUBT	N	9	2	6	17	3	57	111	93	262	1	3	4	193	63	333	2439	206	211	2935
BIOCHEMISTRY	N			1	1	1	11	39	33	83		1	1	36	12	61	433	65	55	566
BIOPHYSICS	N			1	1		2	5	2	9		1	1	2	2	7	39	5	7	54
BIOMET,BIOSTAT	N						1	1		2				1	1	3	26	2	1	30
ANATOMY	N						2	3		5				8	1	13	100	5	6	115

168

Appendix B - Part II continued

		CHICANO				PUERTO RICAN	ASIAN				OTHER			UNKNOWN			TOTAL			
FIELD OF PH.D.		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL
CYTOLOGY	N	2			2		1	4	1	6				2	2	6	46	7	2	57
EMBRYOLOGY	N						1			1				2		2	27			27
IMMUNOLOGY	N						2	2	2	6	1		1	2		2	71	6	3	80
BOTANY	N	1	1	2	4			5	5	10				16	1	22	124	8	13	150
ECOLOGY	N						1			1				4	1	7	66	1	1	70
HYDROBIOLOGY	N																3		1	4
MICROBIO &BACT	N	2			2		7	7	7	21				23	10	48	335	25	13	389
ANIMAL PHYSIOL	N						4	5	4	13				9	2	12	213	10	10	234
PLANT PHYS	N			1	1			7	4	11				3	1	5	37	11	7	56
ZOOLOGY	N		1		1		3	1	2	6				20	2	26	201	5	6	216
GENETICS	N			1	1		4	3	5	12				8	2	12	126	7	13	148
ENTOMOLOGY	N							3	6	10				1	2	6	27	3	11	45
MOLECULAR BIO	N	1			1	1	5	6	3	14				7	2	9	153	9	10	172
NUTRITION/DIET	N						2	3	2	7					1	1	32	5	6	43
BIO SCI, GEN	N	2			2	1	3	5	4	12		1	1	27	8	51	171	9	16	212
BIO SCI, OTHER	N	1			1		8	12	13	33				22	13	40	209	23	30	267
AG SCI SUBT	N	2			2		3	18	27	48				5	13	21	102	32	46	183
AGRONOMY	N							2	3	5					1	1	1	3	5	9
AG ECON	N						1	2	5	8				2	1	4	8	4	5	18
ANIMAL HUSBAND	N														1	1	1		1	2
FOOD SCI &TECH	N	1			1		2	7	9	18				2	4	6	39	11	17	67
FISH &WILDLIFE	N														1	1	5	2		7
FORESTRY	N																2			2
HORTICULTURE	N								2	2					1	1	5	1	3	9
SIOLS&SOIL SCI	N							1	1	2							2	1	2	5
ANIMAL SCI	N							2	6	8						1	19	3	7	30
PHYTOPATHOLOGY	N	1			1			3	1	4				1	1	3	15	4	3	23
AG, GENERAL	N																1			1
AG, OTHER	N							1		1					3	3	4	3	3	10
MED SCI SUBT	N	1			1	1	10	25	11	46				24	10	55	414	50	24	509
PUBLIC HEALTH	N	1			1		3	4	3	10				3	2	14	118	12	5	144
VETERINARY MED	N																6	1	1	8
PARASITOLOGY	N						2			2							13		1	14
PATHOLOGY	N							2		2				2	1	4	37	7		45
PHARMACOLOGY	N					1	2	8	1	11				4	3	12	89	13	4	111
PHARMACY	N							8	5	13					2	2	8	10	6	24
MED SCI, GEN	N													4	1	6	12	1		14
MED SCI, OTHER	N						3	3	2	8				11	1	17	131	6	7	149
ENVIRONM. SCI	N							1		1				2	1	4	42	3	2	48
SOCIAL SCI TOT	N	18	1	4	23	16	46	33	61	145	5	1	6	394	93	629	5399	184	283	6023
ANTHROPOLOGY	N	3		1	4		5	2	7	14				41	4	57	462	14	25	515
COMMUNICATIONS	N					1		2	3	5				12	1	23	243	5	9	267
SOCIOLOGY	N	2		1	3	4	5	4	9	18				36	17	69	666	36	52	772
ECONOMICS	N						2	6	10	19				21	11	38	246	16	38	307
ECONOMETRICS	N														1	1	2	1	1	4

Appendix B - Part II continued

FIELD OF PH.D.		CHICANO				PUERTO RICAN	ASIAN				OTHER			UNKNOWN			TOTAL			
		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL
STATISTICS	N					1		2	3	5		1	1	1	2	4	7	3	8	19
GEOGRAPHY	N								2	2				5	1	7	44	4	7	56
AREA STUDIES	N						3	1	1	5				2		2	23	3	1	27
POL SCI,PUB AD	N	3			3	3	2	3	3	8				16	10	39	298	11	16	338
POLITICAL SCI	N	1			1				1	1				5	1	7	99	4	2	106
PUBLIC ADMIN	N													4		4	10	1		11
INTL RELATIONS	N						1		4	5	1		1	4	2	7	55	4	6	67
URBAN&REG PLAN	N										1		1	1		2	30		3	34
SOCIAL SCI,GEN	N						1			1				1	1	4	33	3	1	39
SOC SCI, OTHER	N			1	1			2		2				13	1	20	108	5	5	124
PSYCH SUBTOTAL	N	9	1	1	11	7	27	11	18	60	3		3	232	41	345	3073	74	109	3337
CLINICAL PSYCH	N	4			4	1	5	2	1	8	1		1	62	6	69	951	14	20	988
COUNSEL & GUID	N	1			1	1	2	1	2	6	1		1	21	3	25	266	4	11	283
DEVEL &GERONT	N						4	2	1	7	1		1	26	9	41	327	11	17	361
ED PSYCH	N	1			1		1	2	1	4				8	4	15	144	11	5	163
SCHOOL PSYCH	N					1								20	2	23	179	5	2	187
EXPERIMT PSYCH	N	1			1		2	2		4				18	4	22	329	8	7	345
COMPARATIVE	N																22		1	23
PHYSIOLOGICAL	N								2	2				10	2	12	131	3	5	139
INDUS&PERSON.	N						1		2	3					2	2	27	1	5	33
PERSONALITY	N						1		1	3				3		3	75	1	2	79
PSYCHOMETRICS	N							1		1				2	1	3	13	1	1	15
SOCIAL PSYCH	N	1			1	2	8	1	3	12				13	2	15	215	6	19	240
PSYCH, GEN	N	1	1		2	2	1		4	7				41	3	99	205	5	10	279
PSYCH, OTHER	N			1	1		2		1	3				8	3	16	189	4	4	202
ARTS & HUM TOT	N	71	11	5	88	10	50	29	39	119	11	2	13	491	92	732	5756	335	226	6483
ART, APPLIED	N								1	1							3		1	4
ART, HIST&CRIT	N	1			1		1		2	3				28	1	34	249	5	7	268
HIST, AMERICAN	N						3			3				13		15	288	2	3	296
HIST, EUROPEAN	N	2			2		1			1				15	3	18	267	6	7	281
HISTORY, OTHER	N					2	8	2	6	16	1		1	36	4	50	245	11	14	280
HIST&PHIL/SCI	N													3	1	4	32	5	2	39
AMERICAN STUD.	N													1		1	40			40
MUSIC	N	2			2		5	3	4	12				28	6	46	276	9	10	308
SPCH AS DR ART	N							1		1				22	2	29	157	1	2	165
ARCHEOLOGY	N													3		3	36	1	3	40
RELIGION	N	1			1		1	1		2				1	1	3	58	2	1	62
PHILOSOPHY	N					2		2	3	5				19	1	24	226	8	9	247
LINGUISTICS	N	1	1	1	3		3	6	8	17				26	14	48	202	23	42	275
COMPARATVE LIT	N			1	1		2			2				2	2	5	73	9	7	90
AMERICAN L&L	N	1			1				4	4	4		4	18	3	22	356	2	10	369
ENGLISH L&L	N	4		1	6		12	6	6	24		1	1	130	18	204	1556	44	38	1702
GERMAN L&L	N						1	1		2	1		1	22	5	36	252	49	12	323
RUSSIAN L&L	N											1	1	6	2	9	87	7	5	100
FRENCH L&L	N	2			2		6			6	3		3	31	12	53	516	80	16	622
SPAN &PORT L&L	N	51	10	1	62	6			1	1	2		2	24	5	34	339	40	11	396
ITALIAN L&L	N													3		3	32	1		33
CLASSICAL L&L	N	1			1									9		10	112	2	4	119
OTHER LANG.	N	1			1		5	5	2	13				23	6	36	110	9	10	137
ARTS & HUM,GEN	N	1			1									7		7	33	1	1	35
ARTS&HUM,OTHER	N	3		1	4		2	2	2	6				21	6	38	211	18	11	252

Appendix B - Part II continued

FIELD OF PH.D.		CHICANO				PUERTO RICAN	ASIAN				OTHER			UNKNOWN			TOTAL			
		U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S.	TOTAL	U.S.	NON-U.S. PERM.	NON-U.S. TEMP.	TOTAL
PROF FLDS TOT	N	8			8	2	12	8	9	29		1	1	62	18	100	791	28	48	890
RELIGION &THEO	N													2	1	3	2	1		3
THEOLOGY	N														1	3	48	2	4	56
BUSINESS ADMIN	N	1			1		2	2	1	5				10	4	18	104	5	12	125
HOME ECONOMICS	N						2	2	5	9				7	7	16	154	4	14	174
JOURNALISM	N													1	1	2	7		1	8
SPEECH&HEARING	N	1			1		2		1	3				14		21	179	3	2	192
LAW, JURISPRUD	N								1	1					2	3		2	2	5
SOCIAL WORK	N	6			6	2	3	1	1	5		1	1	17	2	21	164	4	8	179
LIB & ARCH SCI	N						3	2		5				8		8	85	4	2	91
PROF FLD,OTHER	N							1		1				3		5	48	3	3	57
EDUCATION TOT	N	62	1	2	65	31	54	38	96	188	10	2	12	601	65	878	7924	121	283	8552
FOUNDTNS-S&P	N	2			2	1	5	5	5	15				21	5	28	259	10	19	290
ED PSYCH	N	3			3	1	9	3	6	18	1		1	47	4	58	693	16	18	735
ELEMNT ED, GEN	N	1			1		8	2	8	18				60	5	70	571	3	17	597
SECONDY ED,GEN	N	3			3	1			6	6				13	3	19	195	2	10	210
HIGHER ED	N	3			3	11	2	4	6	12	1		1	16	7	25	497	13	12	526
ADULT ED(919)	N	1			1	1	1	1	2	4				8		8	135	2	6	143
ED MEAS & STAT	N						2	1	2	5				8	2	10	105	1	7	113
CURRIC & INSTR	N	11			11	5	11	3	15	29	2	1	3	32	8	45	1048	8	44	1106
EDUC ADMIN&SUP	N	14			14	3		2	8	10	1		1	53	5	69	821	8	17	858
GUIDANCE (940)	N	7			7		2	3	2	7				55	1	63	787	7	13	815
SPECIAL ED	N	3	1		4		3	1	1	5		1	1	44	3	50	449	11	7	471
AUDIO-VIS MED	N					1		2	1	3				7		7	57	4	1	63
AGRICULTURE	N								1	1									1	1
ART	N							2		2				7		11	77	2	5	88
BUSINESS	N							1		1				13		13	116	1	2	119
ENGLISH	N					1	1	2	1	4	2		2	15	1	21	156	6	5	172
FOREIGN LANG	N	1			1	1			3	3				3	4	7	45	1	7	53
HOME ECONOMICS	N								4	4				10	2	12	114	4	13	132
INDUST ARTS	N																2			2
MATHEMATICS	N					1								8	1	10	103		4	108
MUSIC	N	1			1		2		2	4				8	1	11	100	1	4	107
READING	N	1			1		1			1				2		2	86	1	1	88
PHYS ED (988)	N	2			2	1		1	3	4				39	3	45	384	7	17	411
SCIENCE ED	N			1	1		1	1	5	7				10	2	16	73	1	10	88
SOCIAL SCI ED	N	1			1				1	1				5		6	50		1	52
SPEECH ED	N																12		1	13
VOCATIONAL ED	N								1	1				5		5	117		2	119
OTHR TEACH FLD	N					1	1	1	4	6	1		1	41	2	47	256	3	10	273
EDUCATIUN, GEN	N	5			5	1	3	3	5	11	1		1	34	4	174	291	9	18	456
ED, OTHER	N	3		1	4	1	2		4	6	1		1	37	2	46	325		11	343
OTHER/UNSP FLD	N															25	23	1	1	51

APPENDIX C

QUESTIONNAIRES AND SPECIALTY LISTS

A. 1975 Comprehensive Roster Survey of Doctoral Scientists and Engineers

B. 1976 Survey of Earned Doctorates

OMB No [illegible]

1975 SURVEY OF DOCTORAL SCIENTISTS AND ENGINEERS

CONDUCTED BY THE NATIONAL RESEARCH COUNCIL WITH THE SUPPORT OF THE NATIONAL SCIENCE FOUNDATION

THE ACCOMPANYING LETTER requests your assistance in this biennial survey of doctoral scientists and engineers – including the fields of the natural and social sciences, mathematics, and engineering.

PLEASE READ the instructions for each question carefully and answer by printing your reply or entering an 'X' in the appropriate box.

PLEASE CHECK the pre-printed information to be certain that it is correct and complete.

PLEASE RETURN the completed form in the enclosed envelope to the Commission on Human Resources, JH 638, National Research Council, 2101 Constitution Avenue, N.W., Washington, D.C. 20418.

NOTE: ALL INFORMATION YOU PROVIDE WILL BE TREATED AS CONFIDENTIAL AND USED IN GROUP COMPARISONS FOR RESEARCH PURPOSES ONLY.

____

____

______________________________ (10)

If your name and address are incorrect, please enter correct information on the lines provided above. Include ZIP CODE.

If there is an alternate address through which you can always be reached, please provide it on the line below

C/O Number Street City State ZIP CODE (11)

1. Date of Birth Mo Day Year (12-16)	**2. State or Foreign Country of Birth** (17-18)	**3. Citizenship** (19) USA 0 ☐ Non-USA, specify country 1 ☐ ________ (20-21)	**4. Sex** (22) 1 ☐ Male 2 ☐ Female
5. Racial/Ethnic Identification	0 ☐ White/Caucasian 1 ☐ Black/Negro/Afro-American 2 ☐ American Indian	3 ☐ Mexican-American/Chicano 4 ☐ Puerto Rican American 5 ☐ Oriental	6 ☐ Other Asian (23) 7 ☐ Other, specify ________

6. List in the table below all collegiate and graduate degrees, excluding honorary degrees, that have been awarded to you. Please check the pre-printed information, including the number and name of the specialty from the list on page 3, to be certain that it is correct and complete.

Type of Degree	Granted Mo Yr.	Major Field (Use Specialities List) Name Number	Institution Name City (or campus) & State
Bachelor's			
Master's			
Doctorate			
Other, Specify			

PLEASE NOTE that in Items 7-10 information is requested for both the current year, as of the week of February 9-15, 1975, and last year, as of the week of February 10-16, 1974.

7. What was your employment status as of the periods indicated?
(Check only one category in each year)

	1974		1975
Employed full-time, science or engineering related position	☐	1	☐
Employed full-time, nonscience or nonengineering related position	☐	2	☐
Employed part-time, science or engineering related position	☐	3	☐
Employed part-time, nonscience or nonengineering related position	☐	4	☐
Postdoctoral appointment (fellowship, traineeship, research associateship, etc.)	☐	5	☐
Unemployed and seeking employment	☐	6	☐
Specify number of months unemployed: ________ (66-67)			
Unemployed and not seeking employment	☐	7	☐
Retired and not employed	☐	8	☐
Specify year of retirement: ________ (68-69)			
Other, specify: ________	☐	9	☐
	(64)		(65)

7a. If you were employed full-time during February 9-15, 1975, in a position unrelated to science or engineering, what was the MOST important reason for taking the position?

	1975
Prefer nonscience or nonengineering position	☐ 1
Promoted out of science or engineering position	☐ 2
Pay is better	☐ 3
Locational preference	☐ 4
Science or engineering position not available	☐ 5
Other, specify ________	☐ 6
	(70)

7b. If you were employed part-time during February 9-15, 1975, were you seeking full-time employment? 1 ☐ Ye 2 ☐ No (71)

Please do not write in this space

1
1 2-9 ctr # C
10 11
12 13 14 15 16
17 18 19 20 21
22 23
B
24 25 26
27 28 29
30 31 32 33 34 35
M
36 37 38
39 40 41
42 43 44 45 46 47
D
48 49 50
51 52 53
54 55 56 57 58 59
O
60 61 62 53
64 65
66 67 68 69
70 71

8. Which category below best describes the type of organization of your principal employment OR postdoctoral appointment?

(Check only one category in each year.)

	1974		1975
Business or industry	☐	1	☐
Junior college, 2-year college, technical institute	☐	2	☐
Medical school	☐	3	☐
4-year college or university, other than medical school	☐	4	☐
Elementary or secondary school system	☐	5	☐
Hospital or clinic	☐	6	☐
U.S. military service, active duty, or Commissioned Corps, e.g., USPHS, NOAA	☐	7	☐
U.S. government, civilian employee	☐	8	☐
State government	☐	9	☐
Local or other government, specify: ______________	☐	10	☐
[illegible]ernational Agency	☐	11	☐
Non-profit organization, other than hospital, clinic, or educational institution	☐	12	☐
Other, specify: ______________	☐	13	☐
	(72-73)		(74-75)

9. What were the primary (A) and secondary (B) work activities related to your position?

(Check only one box in each column.)

	1974 A	1974 B		1975 A	1975 B
Management or administration of:					
Research and development	☐	☐	1	☐	☐
Other than research and development	☐	☐	2	☐	☐
Both	☐	☐	3	☐	☐
Basic research	☐	☐	4	☐	☐
Applied research	☐	☐	5	☐	☐
Development of equipment, products, systems, data	☐	☐	6	☐	☐
Design	☐	☐	7	☐	☐
Teaching	☐	☐	8	☐	☐
Report or other technical writing, editing	☐	☐	9	☐	☐
Production	☐	☐	10	☐	☐
Consulting, specify: ______________	☐	☐	11	☐	☐
Professional services to individuals	☐	☐	12	☐	☐
Quality control, inspection, testing	☐	☐	13	☐	☐
Sales, marketing, purchasing, estimating	☐	☐	14	☐	☐
Other, specify: ______________	☐	☐	15	☐	☐
	(10-13)			(14-17)	

72 73 74 75

2
1 2-8 ctr #

10 11 12 13

14 15 16 17

10. From the Degree and Employment Specialties List on page 4, select and enter both the number and title of the scientific specialty most closely related to your principal employment or postdoctoral appointment. Write in your specialty if it is not on the list.

1974 ___ ___ ___ ______________ Number Title of Specialty (18-20)

1975 ______________ Number Title of Specialty (21-23)

18 19 20

21 22 23

Please answer items 11 through 13 regarding your employment during the week of February 9-15, 1975.

11. What percent of time did you devote to each of the following activities?

	%	
Management or administration of		
Research and development	________	(24)
Other than research and development	________	(26)
Both	________	(28)
Basic research	________	(30)
Applied research	________	(32)
Development	________	(34)
Design	________	(36)
Teaching	________	(38)
Consulting	________	(40)
Other, specify ______________ ___	________	(42)
TOTAL	100%	

12. Please give the name of your principal employer (organization, company, etc., or, if self-employed, write "self"), and actual place of employment.

____
Name of Employer (44-49)

____
Number Street

____
City State ZIP Code (50-54)

24 25 26 27 28 29

30 31 32 33 34 35

36 37 38 39 40 41

42 43

44 45 46 47 48 49

50 51 52 53 54

13. What was the basic annual salary* associated with your principal professional employment during the week of February 9-15, 1975? If you were on a postdoctoral appointment (e.g., fellowship, traineeship, research associateship), what was your annual stipend plus allowances?

$______________ per year (55-57)

55 56 57

*NOTE: Basic annual salary is your annual salary before deductions for income tax, social security, retirement, etc., but does not include bonuses, overtime, summer teaching, or other payment for professional work.

If academically employed:

a. Check whether salary was for ☐ 9-10 months or ☐ 11-12 months. (58)

58

b. Did you hold a tenured position during February 9-15, 1975? 0 ☐ Yes 1 ☐ No. (59) **If yes, what year was the tenure granted?** ______________ (60-61)

59 60 61

c. What is the rank of your position?

1 ☐ Professor
2 ☐ Associate Professor
3 ☐ Assistant Professor
4 ☐ Instructor
5 ☐ Lecturer
6 ☐ Dean
7 ☐ President or Chancellor
8 ☐ Other, specify: ______________
9 ☐ Does not apply
(62)

62

14. How many years of professional work experience, including teaching, have you had? ____________ Year(s) (63-64)

15. Have you ever held a postdoctoral appointment? 0 ☐ Yes 1 ☐ No (65)

If yes, list below the time periods of your most recent postdoctoral appointments.

Appointment	**Starting Year**		**Total Months**	
Most Recent	________	(66-67)	________	(68-69)
Second Most Recent	________	(70-71)	________	(72-73)
Third Most Recent	________	(74-75)	________	(76-77)

How many other postdoctoral appointments have you held? ____________ (78)

16. Have you ever been a full-time employee (excluding summer employment) of business or industry since earning your doctorate?

0 ☐ Yes 1 ☐ No (10)

If yes,

a. For how many years?

____________ Year(s) (11-12)

b. If you were employed by business or industry in February, 1975, check here ☐. If not, how many years ago did you leave your most recent business or industry employment?

____________ Year(s) (14-15)

17. Have you ever been a full-time employee (excluding summer employment) of an academic institution or organization since earning your doctorate?

0 ☐ Yes 1 ☐ No (16)

If yes,

a. For how many years?

____________ Year(s) (17-18)

b. If you were employed by an academic institution or organization in February, 1975, please check here ☐. If not, how many years ago did you leave your most recent academic employment?

____________ Year(s) (20-21)

18. Have you ever been a full-time employee (excluding summer employment) of government (federal, state, or local) since earning your doctorate?

0 ☐ Yes 1 ☐ No (22)

If yes,

a For how many years?

____________ Year(s) (23-24)

b. If you were employed by government in February, 1975, check here ☐. If not, how many years ago did you leave your most recent government employment?

____________ Year(s) (26-27)

---

19. Listed below are selected topics of critical national interest. If you devoted a significant proportion of your professional time to any of these problem areas in February, 1975, please check the box for the one on which you spent the MOST time.

Education
- 1 ☐ Teaching
- 2 ☐ Other

3 ☐ Health
4 ☐ Defense
5 ☐ Environmental protection, pollution control
6 ☐ Space
7 ☐ Crime prevention and control
8 ☐ Food production and technology
9 ☐ Energy and fuel
10 ☐ Other mineral resources
11 ☐ Community development and services
12 ☐ Housing (planning, design, construction)
13 ☐ Transportation, communications
14 ☐ Other, specify ______________________________

(28-29)

---

20. Was any of your work in February, 1975, supported or sponsored by U.S. Government funds?

0 ☐ Yes 1 ☐ No 2 ☐ Don't know (30)

If yes, which of the following federal agencies or departments were supporting the work? (Check all that apply.)

31 ☐ NASA
32 ☐ National Science Foundation
33 ☐ Environmental Protection Agency
34 ☐ Energy Research & Development Administration (AEC)
35 ☐ Nuclear Regulatory Commission (AEC)
36 ☐ Agency for International Development
37 ☐ Department of the Interior
38 ☐ National Institutes of Health, HEW
39 ☐ Alcohol, Drug Abuse & Mental Health Administration, HEW
40 ☐ Office of Education, HEW
41 ☐ Other HEW, specify: ____________
42 ☐ Department of Defense
43 ☐ Department of Commerce
44 ☐ Department of Agriculture
45 ☐ Department of Transportation
46 ☐ Department of Justice
47 ☐ Department of Housing and Urban Development
48 ☐ Other agency or department, specify ____________
49 ☐ Don't know source agency

63 64
65
66 67 68 69
70 71 72 73
74 75 76 77
78
3
1 2-9 ctr
10 11 12
13 14 15
16 17 18
19 20 21
22 23 24
25 26 27
28 29
31 32 33
35 36 37
39 40 41
43 44 45
47 48 49

SURVEY OF DOCTORAL SCIENTISTS AND ENGINEERS

DEGREE AND EMPLOYMENT SPECIALTIES LIST

MATHEMATICAL SCIENCES

000 · Algebra
010 · Analysis & Functional Analysis
020 · Geometry
030 · Logic
040 · Number Theory
052 · Probability
055 · Math. Statistics (see also 544, 670, 725, 729)
060 · Topology
080 · Computing Theory & Practice
082 · Operations Research (see also 477)
085 · Applied Mathematics
089 · Combinatorics & Finite Mathematics
091 · Physical Mathematics
098 · Mathematics, General
099 · Mathematics, Other*

ASTRONOMY

101 · Astronomy
102 · Astrophysics

PHYSICS

110 · Atomic & Molecular Physics
120 · Electromagnetism
130 · Mechanics
132 · Acoustics
134 · Fluids
135 · Plasma Physics
136 · Optics
138 · Thermal Physics
140 · Elementary Particles
150 · Nuclear Structure
160 · Solid State
198 · Physics, General
199 · Physics, Other*

CHEMISTRY

200 · Analytical
210 · Inorganic
215 · Synthetic Inorganic & Organometallic
220 · Organic
225 · Synthetic Organic & Natural Products
230 · Nuclear
240 · Physical
245 · Quantum
250 · Theoretical
255 · Structural
260 · Agricultural & Food
265 · Thermodynamics & Material Properties
270 · Pharmaceutical
275 · Polymers
280 · Biochemistry (see also 540)
285 · Chemical Dynamics
298 · Chemistry, General
299 · Chemistry, Other*

EARTH, ENVIRONMENTAL & MARINE SCIENCES

301 · Mineralogy, Petrology
305 · Geochemistry
310 · Stratigraphy, Sedimentation
320 · Paleontology
330 · Structural Geology
341 · Geophysics (Solid Earth)
350 · Geomorph., Glacial Geology
360 · Hydrology
370 · Oceanography
381 · Atmospheric Chemistry & Physics
382 · Atmospheric Dynamics
391 · Applied Geology, Geol. Engr., Econ. Geol.
388 · Environmental Sciences, General
389 · Environmental Sciences, Other*
397 · Marine Sciences, Other*
398 · Earth Sciences, General
399 · Earth Sciences, Other*

ENGINEERING

400 · Aeronautical & Astronautical
410 · Agricultural
415 · Biomedical
420 · Civil
430 · Chemical
435 · Ceramic
440 · Electrical
445 · Electronics
450 · Industrial, Manufacturing
455 · Nuclear
460 · Engineering Mechanics
465 · Engineering Physics
470 · Mechanical
475 · Metallurgy & Phys. Met. Engr.
477 · Operations Research, Systems (see also 082)
479 · Fuel Technology, Petrol Engr.
480 · Sanitary/Environmental
486 · Mining
497 · Materials Science Engr.
498 · Engineering, General
499 · Engineering, Other*

AGRICULTURAL SCIENCES

500 · Agronomy
501 · Agricultural Economics
502 · Animal Husbandry
504 · Fish & Wildlife
505 · Forestry
506 · Horticulture
507 · Soils & Soil Science
510 · Animal Sciences
511 · Phytopathology
517 · Food Science & Technology (see also 573)
518 · Agriculture, General
519 · Agriculture, Other*

MEDICAL SCIENCES

520 · Medicine & Surgery
522 · Public Health
523 · Veterinary Medicine
524 · Hospital Administration
527 · Parasitology
534 · Pathology
536 · Pharmacology
537 · Pharmacy
538 · Medical Sciences, General
539 · Medical Sciences, Other*

BIOLOGICAL SCIENCES

540 · Biochemistry (see also 280)
542 · Biophysics
543 · Biomathematics
544 · Biometrics, Biostatistics (see also 055, 670, 725, 729)
545 · Anatomy
546 · Cytology
547 · Embryology
548 · Immunology
550 · Botany
560 · Ecology
562 · Hydrobiology
564 · Microbiology & Bacteriology
566 · Physiology, Animal
567 · Physiology, Plant
569 · Zoology
570 · Genetics
571 · Entomology
572 · Molecular Biology
573 · Food Science & Technology (see also 517)
574 · Behavior/Ethology
578 · Biological Sciences, General
579 · Biological Sciences, Other*

PSYCHOLOGY

600 · Clinical
610 · Counseling & Guidance
620 · Developmental & Gerontological
630 · Educational
635 · School Psychology
641 · Experimental
642 · Comparative
643 · Physiological
650 · Industrial & Personnel
660 · Personality
670 · Psychometrics (see also 055, 544, 725, 729)
680 · Social
698 · Psychology, General
699 · Psychology, Other*

SOCIAL SCIENCES

700 · Anthropology
703 · Archeology
708 · Communications*
709 · Linguistics
710 · Sociology
720 · Economics (see also 501)
725 · Econometrics (see also 055, 544, 670, 729)
729 · Social Statistics (see also 055, 544, 670, 725)
740 · Geography
745 · Area Studies*
750 · Political Science, Public Administration
755 · International Relations
770 · Urban & Reg. Planning
775 · History & Phil. of Science
798 · Social Sciences, General
799 · Social Sciences, Other*

ARTS & HUMANITIES

841 · Fine & Applied Arts (including Music, Speech, Drama, etc.)
842 · History
843 · Philosophy, Religion, Theology
845 · Languages & Literature
846 · Other Arts and Humanities*

EDUCATION & OTHER PROFESSIONAL FIELDS

938 · Education

882 · Business Administration
883 · Home Economics
884 · Journalism
885 · Speech and Hearing Sciences
886 · Law, Jurisprudence
887 · Social Work
891 · Library & Archival Science
898 · Professional Field, Other*

899 OTHER FIELDS*

*Identify the specific field in the space provided on the questionnaire

NSF Form 558 1974
OMB No. 99-R0290
Approval Expires June 30, 1976

SURVEY OF EARNED DOCTORATES

This form is to be returned to the GRADUATE DEAN, for forwarding to .... Board on Human-Resource Data and Analyses
Commission on Human Resources
National Research Council
2101 Constitution Avenue, Washington, D. C. 20418

Please print or type.

A. Name in full: .... (9-30)
(Last Name) (First Name) (Middle Name)

Cross Reference: Maiden name or former name legally changed .... (31)

B. Permanent address through which you could always be reached: (Care of, if applicable) ....
....
(Number) (Street) (City)
....
(State) (Zip Code) (Or Country if not U.S.)

C. U.S. Social Security Number: ___ ___ ___ - ___ ___ - ___ ___ ___ ___ (33-41)

D. Date of birth: .... **Place of birth:** ....
(42-46) (Month) (Day) (Year) (47-48) (State) (Or Country if not U.S.)

E. Sex: 1 ☐ Male 2 ☐ Female (49)

F. Marital status: 1 ☐ Married 2 ☐ Not married (including widowed, divorced) (50)

G. Citizenship: 0 ☐ U.S. native 2 ☐ Non U.S., Immigrant (Permanent Resident)
1 ☐ U.S. naturalized 3 ☐ Non-U.S., Non-Immigrant (Temporary Resident) (51)
If Non-U.S., indicate country of present citizenship .... (52-53)

H. Racial or ethnic group: (Check all that apply.) 0 ☐ White/Caucasian 1 ☐ Black/Negro/Afro-American
2 ☐ American Indian 3 ☐ Spanish-American/Mexican-American/Chicano
4 ☐ Puerto Rican-American 5 ☐ Oriental 6 ☐ Other, specify .... (54-56)

I. Number of dependents:
Do not include yourself. (Dependent = someone receiving at least one half of his or her support from you) .... (57)

[redacted]

J. High school last attended: .... (58-59)
(School Name) (City) (State)

Year of graduation from high school: .... (60-61)

K. List in the table below all collegiate and graduate institutions you have attended including 2-year colleges. List chronologically, and include your doctoral institution as the last entry.

Institution Name	Location	Years Attended		Major Field Use Specialties List		Minor Field	Degree (if any)		
		From	To	Name	Number	Number	Title of Degree	Granted Mo.	Granted Yr.

L. Enter below the title of your doctoral dissertation and the most appropriate classification number and field. If a project report or a musical or literary composition (not a dissertation) is a degree requirement, please check box. ☐ (44)

Title .... Classify using Specialties List
.... Number Name of field
....

M. Name the department (or interdisciplinary committee, center, institute, etc.) and school or college of the university which supervised your doctoral program: ....
(Department/Institute/Committee/Program) (School)

N. Name of your dissertation adviser: ....
(Last Name) (First Name) (Middle Initial)

continued on next page

Please Do Not Write In This Space

1
8
9-30 NA
cr( ) 31 d( ) 32
33-41 SS
42 43 44 45 46
47 48
49 50
51 52 53
54 55 56 57
HS
58 59 60 61
UG
62
63 64 65 66
B
67 68 69 70 71 72
73 74 75
76 77 78 n( ) 79
2 GR
8
9 10 11 12 13 14
15 16
M
17 18 19 20 21 22
23 24 25
26 27 28
29 30 31 P
D
32 33 34 35 36 37
38 39 40
41 42 43 44 45
TO
46 47 CE-BA
48 49 BA-GE
50 51 GE-MA
52 53 MA-PHD
54 55 GE-PHD
56 57 TI

SURVEY OF EARNED DOCTORATES, Cont.

O. Please check each source from which you received some support during graduate study. Check as many sources as apply.

58 ___ NSF Fellowship
59 ___ NSF Traineeship
60 ___ NIH Fellowship
61 ___ NIH Traineeship
62 ___ NDEA Fellowship
63 ___ Other HEW
64 ___ AEC Fellowship
65 ___ NASA Traineeship
66 ___ GI Bill
67 ___ Other Federal support (specify) ....
68 ___ Woodrow Wilson Fellowship
69 ___ Other U.S. national fellowship (specify) ....
70 ___ University fellowship
71 ___ Teaching Assistantship
72 ___ Research Assistantship
73 ___ Educational fund of industrial or business firm
74 ___ Other institutional funds (specify) ....
75 ___ Own earnings
76 ___ Spouse's earnings
77 ___ Family contributions
78 ___ Loans (NDSL direct)
79 ___ Other loans
80 ___ Other (specify) ....

P. Please check the space which most fully describes your status during the year immediately preceding the doctorate.

0 ☐ Held fellowship
1 ☐ Held assistantship
2 ☐ Held own research grant
3 ☐ Not employed
4 ☐ Part-time employed

Full-time Employed in: (Other than 0, 1, 2)
5 ☐ College or university, teaching
6 ☐ College or university, non-teaching
7 ☐ Elem. or sec. school, teaching
8 ☐ Elem. or sec. school, non-teaching
9 ☐ Industry or business
(11) ☐ Other (specify) ....

(12) ☐ Any other (specify) .... (9)

Q. U.S. veteran status:

0 ☐ Veteran
1 ☐ On active duty
2 ☐ Non-veteran or not applicable (10)

R. How well defined are your postgraduation plans?

0 ☐ Have signed contract or made definite commitment
1 ☐ Am negotiating with a specific organization, or more than one
2 ☐ Am seeking appointment but have no specific prospects
3 ☐ Other (specify) .... (11)

---

0 ☐ Postdoctoral fellowship?
1 ☐ Postdoctoral research associateship?
2 ☐ Traineeship?
3 ☐ Other study (specify) ....

If you check 0, 1, 2, or 3, please answer "T" and omit "U"

4 ☐ Employment? (other than 0, 1, 2, 3)
5 ☐ Military service?
6 ☐ Other (specify) .... (12)

If you checked 4, 5, or 6, please answer "U" and omit "T"

T. If you plan to be on a postdoctoral fellowship, associateship, or traineeship —

What is the field of your postdoctoral appointment?

Classify using Specialties List.

Number .... Field .... (13-15)

What is the primary source of support?

0 ☐ U.S. Government
1 ☐ College or university
2 ☐ Private foundation
3 ☐ Nonprofit, other than private foundation
4 ☐ Other (specify) ....
6 ☐ Unknown (16)

U. If you plan to be employed, enter military service, or other —

What will be the type of employer?

0 ☐ 4-year college or university
1 ☐ Jr. or community college
2 ☐ Elem. or sec. school
3 ☐ Foreign government
4 ☐ U.S. Government
5 ☐ U.S. state or local government
6 ☐ Nonprofit organization
7 ☐ Industry or business
8 ☐ Self-employed
9 ☐ Other (specify) .... (17)

Indicate primary work activity with "1" in appropriate box; secondary work activity (if any) with "2" in appropriate box.

0 ☐ Research and development
1 ☐ Teaching
2 ☐ Administration
3 ☐ Professional services to individuals
5 ☐ Other (specify) .... (18-19)

In what field will you be working?

Please enter number from Specialties List .... (20-22)

V. What is the name and address of the organization with which you will be associated?

....
(Name of Organization)

.... (Street) .... (City, State) (Or Country if not U.S.) (23-28)

W. Please indicate, by circling the highest grade attained, the education of

your father:	none	1 2 3 4 5 6 7 8 Elementary school	9 10 11 12 High school	1 2 3 4 College	MA, MD PhD Graduate	Postdoctoral	(29)
your mother	none	1 2 3 4 5 6 7 8	9 10 11 12	1 2 3 4	MA, MD PhD	Postdoctoral	(30)
	0	1 2 3	4 5	6 7	8 9	(11)	

Signature .... **Date completed** .... (31-33)

58 59
60 61
62 63
64 65
66 67
68 69
70 71
72 73
74 75
76 77
78 79
80

3
8

9
10
11
12
T
13 14 15
16
U
17
18 19
20 21 22
V
23 24 25 26 27 28
W
29
30
31 32 33 1
34

[illegible]

MATHEMATICS

000 — Algebra
010 — Analysis & Functional Analysis
020 — Geometry
030 — Logic
040 — Number Theory
050 — Probability, Math. Statistics
(see also 544, 670, 725, 727, 920)
060 — Topology
080 — Computing Theory & Practice
082 — Operations Research (see also 478)
085 — Applied Mathematics
098 — Mathematics, General
099 — Mathematics, Other*

ASTRONOMY

101 — Astronomy
102 — Astrophysics

PHYSICS

110 — Atomic & Molecular
120 — Electromagnetism
130 — Mechanics
132 — Acoustics
134 — Fluids
135 — Plasma
136 — Optics
138 — Thermal
140 — Elementary Particles
150 — Nuclear Structure
160 — Solid State
198 — Physics, General
199 — Physics, Other*

CHEMISTRY

200 — Analytical
210 — Inorganic
220 — Organic
230 — Nuclear
240 — Physical
250 — Theoretical
260 — Agricultural & Food
270 — Pharmaceutical
275 — Polymer
298 — Chemistry, General
299 — Chemistry, Other*

EARTH SCIENCES

301 — Mineralogy, Petrology
305 — Geochemistry
310 — Stratigraphy, Sedimentation
320 — Paleontology
330 — Structural Geology
341 — Geophysics (Solid Earth)
350 — Geomorph., Glacial Geology
360 — Hydrology
370 — Oceanography
381 — Atmospheric Physics and Chemistry
382 — Atmospheric Dynamics
383 — Atmospheric Sciences, Other*
391 — Applied Geol., Geol. Engr.,
Econ. Geol.
395 — Fuel Tech., Petrol. Engr. (see also 479)
398 — Earth Sciences, General
399 — Earth Sciences, Other*

ENGINEERING

400 — Aeronautical & Astronautical
410 — Agricultural
415 — Biomedical
420 — Civil
430 — Chemical
435 — Ceramic
437 — Computer
440 — Electrical
445 — Electronics
450 — Industrial
455 — Nuclear
460 — Engineering Mechanics
465 — Engineering Physics
470 — Mechanical
475 — Metallurgy & Phys. Met. Engr.
476 — Systems Design, Systems Science
478 — Operations Research (see also 082)
479 — Fuel Tech., Petrol. Engr. (see also 395)
480 — Sanitary
486 — Mining
497 — Materials Science
498 — Engineering, General
499 — Engineering, Other*

ENVIRONMENTAL SCIENCES

589 — Environmental Sciences*

AGRICULTURAL SCIENCES

500 — Agronomy
501 — Agricultural Economics
502 — Animal Husbandry
503 — Food Science & Technology
504 — Fish & Wildlife
505 — Forestry
506 — Horticulture
507 — Soils & Soil Science
510 — Animal Sciences
511 — Phytopathology
518 — Agriculture, General
519 — Agriculture, Other*

MEDICAL SCIENCES

520 — Medicine & Surgery
522 — Public Health
523 — Veterinary Medicine
524 — Hospital Administration
527 — Parasitology
534 — Pathology
536 — Pharmacology
537 — Pharmacy
538 — Medical Sciences, General
539 — Medical Sciences, Other*

BIOLOGICAL SCIENCES

540 — Biochemistry
542 — Biophysics
544 — Biometrics, Biostatistics
(see also 050, 670, 725, 727, 920)
545 — Anatomy
546 — Cytology
547 — Embryology
548 — Immunology
550 — Botany
560 — Ecology
562 — Hydrobiology
564 — Microbiology & Bacteriology
566 — Physiology, Animal
567 — Physiology, Plant
569 — Zoology
570 — Genetics
571 — Entomology
572 — Molecular Biology
576 — Nutrition and/or Dietetics
578 — Biological Sciences, General
579 — Biological Sciences, Other*

PSYCHOLOGY

600 — Clinical
610 — Counseling & Guidance
620 — Developmental & Gerontological
630 — Educational
635 — School Psychology
641 — Experimental
642 — Comparative
643 — Physiological
650 — Industrial & Personnel
660 — Personality
670 — Psychometrics
(see also 050, 544, 725, 727, 920)
680 — Social
698 — Psychology, General
699 — Psychology, Other*

SOCIAL SCIENCES

700 — Anthropology
708 — Communications*
710 — Sociology
720 — Economics (see also 501)
725 — Econometrics
(see also 050, 544, 670, 727, 920)
727 — Statistics
(see also 050, 544, 670, 725, 920)
740 — Geography
745 — Area Studies*
751 — Political Science
752 — Public Administration
755 — International Relations
770 — Urban & Reg. Planning
798 — Social Sciences, General
799 — Social Sciences, Other*

ARTS & HUMANITIES

801 — Art, Applied
802 — Art, History & Criticism
804 — History, American
805 — History, European
806 — History, Other*
807 — History & Philosophy of Science
808 — American Studies
830 — Music
831 — Speech as a Dramatic Art
(see also 885)
832 — Archeology
833 — Religion (see also 881)
834 — Philosophy
835 — Linguistics
836 — Comparative Literature
878 — Arts & Humanities, General
879 — Arts & Humanities, Other*

LANGUAGES & LITERATURE

811 — American
812 — English
821 — German
822 — Russian
823 — French
824 — Spanish & Portuguese
826 — Italian
827 — Classical*
829 — Other Languages*

EDUCATION

900 — Foundations: Social, Philosoph.
910 — Educational Psychology
908 — Elementary Educ., General
909 — Secondary Educ., General
918 — Higher Education
919 — Adult Educ. & Extension Educ.
920 — Educ. Meas. & Stat.
929 — Curriculum & Instruction
930 — Educ. Admin. & Superv.
940 — Guid., Couns., & Student Pers.
950 — Special Education
(Gifted, Handicapped, etc.)
960 — Audio-Visual Media

TEACHING FIELDS

970 — Agriculture Educ.
972 — Art Educ.
974 — Business Educ.
976 — English Educ.
978 — Foreign Languages Educ.
980 — Home Economics Educ.
982 — Industrial Arts Educ.
984 — Mathematics Educ.
986 — Music Educ.
988 — Phys. Ed., Health, & Recreation
989 — Reading Education
990 — Science Educ.
992 — Social Science Educ.
993 — Speech Education
994 — Vocational Educ.
996 — Other Teaching Fields*

998 — Education, General
999 — Education, Other*

OTHER PROFESSIONAL FIELDS

881 — Theology (see also 833)
882 — Business Administration
883 — Home Economics
884 — Journalism
885 — Speech & Hearing Sciences
(see also 831)
886 — Law, Jurisprudence
887 — Social Work
891 — Library & Archival Science
897 — Professional Field, Other*

899 — OTHER FIELDS*

* Identify the specific field in the space provided on the questionnaire.

APPENDIX D

SAMPLE DESIGN, SAMPLING ERRORS AND TESTS OF SIGNIFICANCE

Sample Design and Sampling Error [1]

Statistics presented in Tables I-2, I-3, II-1 to II-4 and II-6 to II-8 of this report were obtained from a stratified random sample. Tables D-1 and D-2 provide information on the sample sizes and response rates by strata for the 1973 and 1975 *Surveys of Doctoral Scientists and Engineers*. Since these surveys are sample surveys, estimates of population values are, therefore, subject to sampling error. The concept of sampling error has been described (U.S. Bureau of the Census, 1974, p. I-1) as follows: "The particular sample used in this survey is one of a large number of all possible samples of the same size that could have been selected using the same sample design. Estimates derived from the different samples would differ from each other. The deviation of a sample estimate from the average of all possible samples is called the sampling error. The standard error of a survey estimate is a measure of the variation among the estimates from the possible samples and thus is a measure of the precision with which an estimate from a particular sample approximates the average result of all possible samples. The relative standard error is defined as the standard error divided by the value being estimated."

To assist in evaluating the data in this report, sampling errors for various statistic values and sample sizes have been calculated assuming a simple random sample and are summarized in Table D-3. The reader can construct the confidence interval deemed appropriate for interpretation of the data.

Comparisons can be made between sampling errors computed on the basis of a simple random sample and those which take stratification into account. Variances were calculated for a number of statistics cited in a recent report on the employment status of doctoral scientists and engineers (Maxfield, et al., 1976) The statistics in the employment study and the 1975 data in the tables referred to above were all based on results of the 1975 survey which was conducted in terms of the stratified sample outlined in Table D-2. The formulas used in estimating sample variances were:

---

[1] This section, except for the first paragraph, is reproduced from an earlier report on the Survey of Doctoral Scientists and Engineers (National Research Council, 1976b, pp. 37-44) with a few modifications to provide illustrations from the tables of this report and Table D-3 has been revised to use sample sizes appropriate to this report.

a) simple random sample

$$\sigma_p = \left[\frac{p(1-p)}{n} \cdot \frac{(N-n)}{(N-1)} \right]^{\frac{1}{2}}$$

b) stratified random sample

$$\sigma_p = \left[\frac{1}{N^2} \cdot \sum_h N_h^2 \; \frac{(N_h-n_h)}{(N_h-1)} \cdot \frac{p_h \cdot (1-p_h)}{n_h} \right]^{\frac{1}{2}}$$

In these formulas, p denotes the estimated proportion of the whole population, N denotes the size of the population, and n denotes the sample size. [1/] Where the same symbols appear with the subscript h, the reference is to stratum h rather than to the whole population or sample.

In this report, as well as in the employment study, many of the estimates are proportions whose base is the estimated labor force or other subgroup in a specified variable-designated category (e.g., U.S. native-born Asian Ph.D.'s). Such estimates are thus ratios of random variables, i.e., estimates based on the sample. The formulas given above are not strictly applicable to these estimates. Operational and time constraints precluded the computation of the more complex formula for the sampling error appropriate to ratio estimates. However, a useful approximation is provided by formula (b) by omitting the finite population correction $(N_h-n_h)/(N_h-1)$ and reinterpreting p to denote the estimated proportion of the specified category that has a given characteristic, N to denote the population number in the specified category, and n to denote the number in the sample with the given characteristic, with the subscript h again denoting a restriction to stratum h.

A table comparing the sampling error estimate when computed using the formula for a simple random sample and the formula for a stratified random sample (omitting the finite population corrections) has been published for 30 selected employment

---

[1/] Note that in the tables given in the text WN is used as an estimate of population size and that N is used as the sample size since the computer does not print a lower case n.

Table D-1

1930-72 UNITED STATES DOCTORAL SCIENTISTS AND ENGINEERS

POPULATION, SAMPLE, AND SURVEY RESPONSE -- 1973

	DOCTORAL ROSTER TOTAL[*] N	SURVEY SAMPLE TOTAL SAMPLE N	RESPONSE N	DECEASED N	NON-RESP.[+] N	NOT CONTACTED[‡] N	RESPONSE RATES[§] (A) %	(B) %
TOTAL	272234	59086	42456	1561	11683	3386	74.5	79.0
FIELD OF PHD/EMPLOYMENT								
MATHEMATICS	15919	4409	3166	83	966	194	73.7	77.1
PHYSICS/ASTRONOMY	24659	5139	3670	109	1087	273	73.5	77.7
CHEMISTRY	43113	7907	5830	202	1460	415	76.3	80.5
EARTH SCIENCES	8525	1986	1497	81	315	93	79.5	83.4
ENGINEERING	38518	6362	4633	97	1306	326	74.3	78.4
BIOSCIENCES	68955	17091	12368	478	3044	1201	75.2	80.8
PSYCHOLOGY	30983	7128	5084	197	1489	358	74.1	76.0
SOCIAL SCIENCES	40265	8142	5555	299	1856	432	71.9	75.9
NON-SCIENCES/UNKNOWN	1297	922	653	15	160	94	72.5	80.7
YEAR OF PHD								
CY 1930-35	9927	2393	1302	426	390	275	72.2	81.6
CY 1936-41	12259	2787	1777	334	467	209	75.7	81.9
CY 1942-45	6501	1773	1187	129	334	123	74.2	79.8
CY 1946-49	10088	2356	1639	123	430	164	74.8	80.4
CY 1950-53	21770	4266	3056	151	783	276	75.2	80.4
CY 1954-57	24920	4847	3603	104	884	256	76.5	80.7
CY 1958-FY 61	26039	5733	4126	110	1252	245	73.9	77.2
FY 1962-63	17711	4695	3410	69	996	220	74.1	77.7
FY 1964-65	22481	5488	3977	36	1155	320	73.1	77.7
FY 1966-67	27529	6244	4566	33	1285	360	73.7	78.2
FY 1968-69	33401	6978	4999	23	1509	447	72.0	76.9
FY 1970-71	39371	7481	5652	15	1475	339	75.8	79.3
FY 1972	19774	3699	2975	5	617	102	80.6	82.8
UNKNOWN	465	346	187	3	106	50	54.9	64.2
CATEGORY OF PHD								
U.S. SCIENCE	252190	48870	35016	1423	9916	2515	74.6	78.6
U.S. NON-SCIENCE	9669	5010	4060	81	729	140	82.7	85.0
FOREIGN	10375	5206	3380	57	1038	731	66.0	76.8
SIZE OF PHD INSTITUTION[‖]								
LESS THAN 50	15190	6615	4708	232	1354	321	74.7	78.5
50 TO 299	98404	18479	13248	524	3842	865	74.5	78.2
MORE THAN 299	138596	23776	17060	667	4720	1329	74.6	79.0
UNCLASSIFIED	20044	10216	7440	138	1767	871	74.2	81.1
SEX								
MALE	248653	47675	34472	1210	9369	2624	74.8	79.2
FEMALE	23581	11411	7984	351	2314	762	73.0	78.3

[*] FIGURES INCLUDE THOSE DECEASED AND THOSE EMPLOYED IN FOREIGN COUNTRIES AND HENCE EXCEED THE TOTAL POPULATION FIGURES REPORTED IN PREVIOUS TABLES.

[+] INCLUDES THOSE TO WHOM SURVEY FORMS WERE MAILED AND NOT RETURNED AS WELL AS THOSE WHO INDICATED THEIR RELUCTANCE TO PARTICIPATE IN THE SURVEY.

[‡] INCLUDES THOSE WHO WERE MEMBERS OF THE SAMPLE BUT FOR WHOM NO CURRENT ADDRESSES COULD BE FOUND.

[§] BOTH RESPONSE RATES COMBINE THE NUMBER DECEASED WITH THE NUMBER OF VALID RESPONSES. RATE "A" IS CALCULATED ON THE TOTAL SAMPLE; RATE "B" IS CALCULATED ON ONLY THOSE CONTACTED.

[‖] SIZE DETERMINED BY THE NUMBER OF DOCTORATES GRANTED BY AN INSTITUTION DURING A GIVEN TIME PERIOD (COHORT).

Source: National Research Council, Doctoral Scientists and Engineers in the United States, 1973 Profile, p. 31.

TABLE D-2

POPULATION, SAMPLE AND SURVEY RESPONSE - 1975

1930-74 DOCTORAL SCIENTISTS AND ENGINEERS

	DOCTORAL ROSTER TOTAL* N	TOTAL SAMPLE N	TOTAL SURVEY RESPONSES# N	RESPONSE RATES+	
				(A) %	(B) %
TOTAL	314002	66779	43821	69.2	74.6
FIELD OF PHD/EMPLOYMENT					
MATHEMATICS	18646	5011	3173	67.7	72.1
PHYSICS/ASTRONOMY	27936	5810	3825	68.4	73.5
CHEMISTRY	47278	8821	5967	70.6	76.6
EARTH SCIENCES	9758	2194	1535	73.4	78.0
ENGINEERING	45228	7352	4861	67.7	73.8
BIOSCIENCES	79409	19433	13371	71.4	76.7
PSYCHOLOGY	36195	7910	5083	68.8	74.1
SOCIAL SCIENCES	48276	9397	5613	65.0	70.2
NONSCIENCES/UNKNOWN	1276	851	393	63.0	74.2
YEAR OF PHD					
CY 1930-35	10070	2386	1263	67.1	75.6
CY 1936-41	12386	2782	1687	71.4	77.0
CY 1942-45	6592	1773	1165	72.9	77.7
CY 1946-49	10245	2351	1561	72.5	77.6
CY 1950-53	22063	4256	2857	72.0	77.1
CY 1954-57	25267	4839	3331	73.0	76.8
CY 1958-FY61	26416	5729	3808	69.7	73.8
FY 1962-63	17943	4692	3117	69.3	73.6
FY 1964-65	22654	5486	3544	67.4	73.1
FY 1966-67	27667	6245	4055	68.0	73.9
FY 1968-69	33587	6976	4556	68.1	73.6
FY 1970-71	39541	7553	5026	68.9	73.7
FY 1972	19827	3731	2607	70.0	76.0
FY 1973-74	39053	7666	5125	66.9	73.6
UNKNOWN	691	314	119	40.9	51.7
CATEGORY OF PHD					
U.S. SCIENCE	291397	56488	38168	69.6	74.5
U.S. NONSCIENCE	10036	4965	2573	74.3	77.4
FOREIGN	12569	5326	3080	60.8	72.4
RACIAL/ETHNIC IDENTIFICATION					
PRE-FY1973-74 PHD**	274989	59148	38723	69.5	74.7
WHITE/CAUCASIAN	26469	3492	2667	76.4	81.1
ORIENTAL	3341	1381	749	54.3	60.9
OTHER MINORITIES	1087	842	524	62.3	68.0
UNKNOWN	8116	1916	1158	60.5	70.4
SEX					
MALE	284721	53352	35149	69.4	74.6
FEMALE	29281	13427	8672	68.3	74.4

*FIGURES INCLUDE THOSE DECEASED AND THOSE EMPLOYED IN FOREIGN COUNTRIES AND HENCE EXCEED THE TOTAL POPULATION FIGURES REPORTED IN VARIOUS TABLES .

#FIGURES INCLUDE THE NUMBER KNOWN DECEASED FROM THE 1975 SURVEY.

+RATE "A" IS THE NUMBER OF 1975 SURVEY RESPONSES DIVIDED BY THE TOTAL SAMPLE MINUS "INACTIVE" SAMPLE MEMBERS. THE "INACTIVE" SAMPLE INCLUDES PERSONS KNOWN DECEASED PRIOR TO THE 1975 SURVEY, AND INDIVIDUALS WHO RESPONDED IN 1973 THAT THEY WERE OUTSIDE OF THE SCOPE OF THE SURVEY. RATE "B" IS THE NUMBER OF 1975 SURVEY RESPONSES DIVIDED BY THE TOTAL SAMPLE MINUS THOSE "INACTIVE" AND THOSE NOT CONTACTED

**RACIAL/ETHNIC DATA ARE NOT AVAILABLE FOR THE PRE-FY1973-74 PH.D. RECIPIENTS.

Source: National Research Council, Doctoral Scientists and Engineers in the United States, 1975 Profile, p. 38.

study statistics (National Research Council, 1976b, p. 42). For most variables the difference between the two errors is small. When the strata are taken into account, sampling errors exceed those calculated ignoring stratification for 10 of the 30 statistics. All but two of these 10 statistics involve female and/or physics/astronomy Ph.D.'s. This effect is largely explained by the omission of the finite population correction factor (fpc) which has a deflating effect on the heavily sampled female strata. With the fpc included, the sampling errors assuming stratification exceed those for a simple sample by more than 0.1 percent in only two (presumably largely overlapping) cases (female Ph.D.'s under 30 and female 1973-1974 Ph.D.'s). Variances computed with the formula for stratified samples were lower than those calculated for simple samples for 7 statistics, all of which involved Ph.D.'s in small employment categories.

For the convenience of the reader Table D-3 has been compiled showing approximate sampling errors for sample sizes which occur frequently in the tables of this report. The finite population correction factor has a negligible effect on most statistics, $\left[\frac{N-n}{N-1}\right]^{\frac{1}{2}} \geq .90$, and has been omitted from the calculations.

In Tables I-3, II-2, II-4 and II-9, the finite correction factor would tend to reduce the approximate sampling errors as computed above by about one-sixth for all statistics on women because the female strata in the population were heavily sampled. (The mean weighting fraction for women is 0.305).

In Tables I-2a, b, c and d, I-3, II-1a, b, and c and II-2a and b the sample sizes are designated by N, the population estimates by WN and the proportions X100 as H (horizontal percent). Tables II-3, II-4, II-5 and II-8 give population estimates and vertical percentages. The sample size is shown as the first row of the totals at the foot of the tables.

Example 1: In Table I-2b the population estimate of those with known racial/ethnic group for the 1945-1949 cohort of Ph.D.'s is 7410 and the sample size N is 1141. The reader can estimate the sampling error of a reported statistic (for instance proportion of doctorates awarded black, native-born U.S. citizens in 1945-1949, 0.9%) by using the formula for σ_p

directly or consulting Table D-3 using rough approximations of the sample size and percentage in proportion form. In this case

$$\sigma_p = \left[\frac{.009(1-\ .009)}{1141}\right]^{\frac{1}{2}} \begin{array}{l} = \quad .003 \\ = \quad 0.3\% \end{array}$$

Table D-3

APPROXIMATE SAMPLING ERRORS*
FOR VARIOUS STATISTICS AND SAMPLE SIZES

Sample Size	Proportion				
	.01 or .99	.05 or .95	.10 or .90	.25 or .75	.50
10	n.a.	n.a.	n.a.	n.a.	.15811
25	n.a.	n.a.	n.a.	.08660	.10000
50	.01407	.03082	.04243	.06124	.07071
100	.00995	.02179	.03000	.04330	.05000
200	.00704	.01541	.02121	.03062	.03536
300	.00574	.01258	.01732	.02500	.02887
600	.00406	.00890	.01224	.01768	.02041
900	.00332	.00726	.01000	.01443	.01667
2,000	.00222	.00487	.00671	.00968	.01118
6,000	.00128	.00281	.00387	.00559	.00645
9,000	.00105	.00230	.00316	.00456	.00527
25,000	.00063	.00138	.00190	.00274	.00316
30,000	.00057	.00126	.00173	.00250	.00289
35,000	.00053	.00116	.00160	.00231	.00267
40,000	.00050	.00109	.00150	.00217	.00250

* Errors were computed with the formula $\sigma_p = \left[\frac{p(1-p)}{n}\right]^{\frac{1}{2}}$, where "n" is the sample size

Example 2: In Table II-5 the population estimate for "Other Minorities" is 4,306 and the sample size N is 905. The sampling error of a reported statistic (for instance proportion of "Other Minorities" Ph.D.'s employed by the Federal Government, 7.1%) can be estimated by using the formula for σ_p

$$\sigma_p = \left[\frac{.071(1-.071)}{905}\right]^{\frac{1}{2}} = 0.0085$$

$$= 0.85\%$$

A rough approximation can also be obtained by using Table D-3.

Tests of Significance

In this report, except in the discussion of median salaries, statistical statements based on samples have been checked for validity. Differences that are described in the highlights are statistically significant at the 5% level unless otherwise stated.

The tests that were made fall in two broad categories:

1. A test that the difference between two percentages is 0, using the t-test (U.S. Bureau of the Census, 1974). In general normality was assumed and and in most cases, but not all, it was reasonable to assume that the co-variance term in the variance of the difference between the two percentages was zero.

2. Multiple comparisons involving a comparison of one subgroup of the population with several other subgroups, e.g., a statement that a percentage for Blacks is greater than the comparable percentage for all other racial/ethnic groups. Here the Bonferroni method (Dayton and Schafer, 1973) was used. This method involves a series of tests, testing each of the comparisons involved in the statistical statement, e.g., the percentage of Blacks is tested against the percentage for each of the 4 other racial/ethnic groups.